THIS WEEK'S National Petroleum NEWS

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Gas Measurement Short Course, University of Oklahoma, College of Engineering, Norman, Okla., Apr. 15, 16, 17.

Kansas Oil Men's Association, Broadview Hotel Roof Garden, Wichita, Apr. 17, 18.

National Petroleum Association, Cleveland Hotel, Cleveland, O., April 23, 24.

Indiana Petroleum Association, Hotel Severin, Indianapolis, Apr. 24.

Kentucky Petroleum Marketers Association, Louisville, May 6, 7.

National Oil Scouts Association of America, San Antonio, Tex., May 19, 20.

Natural Gasoline Association of America, Mayo Hotel, Tulsa, May 20, 21, 22.

American Society for Testing Materials, Atlantic City, N. J. June 23 to 27.

North American Gasoline Tax Conference, King Edward Hotel, Toronto, Ont., Sept. 2, 3, 4.

National Safety Council, Petroleum Section, Pittsburgh, Pa., Sept. 29 to Oct. 4.

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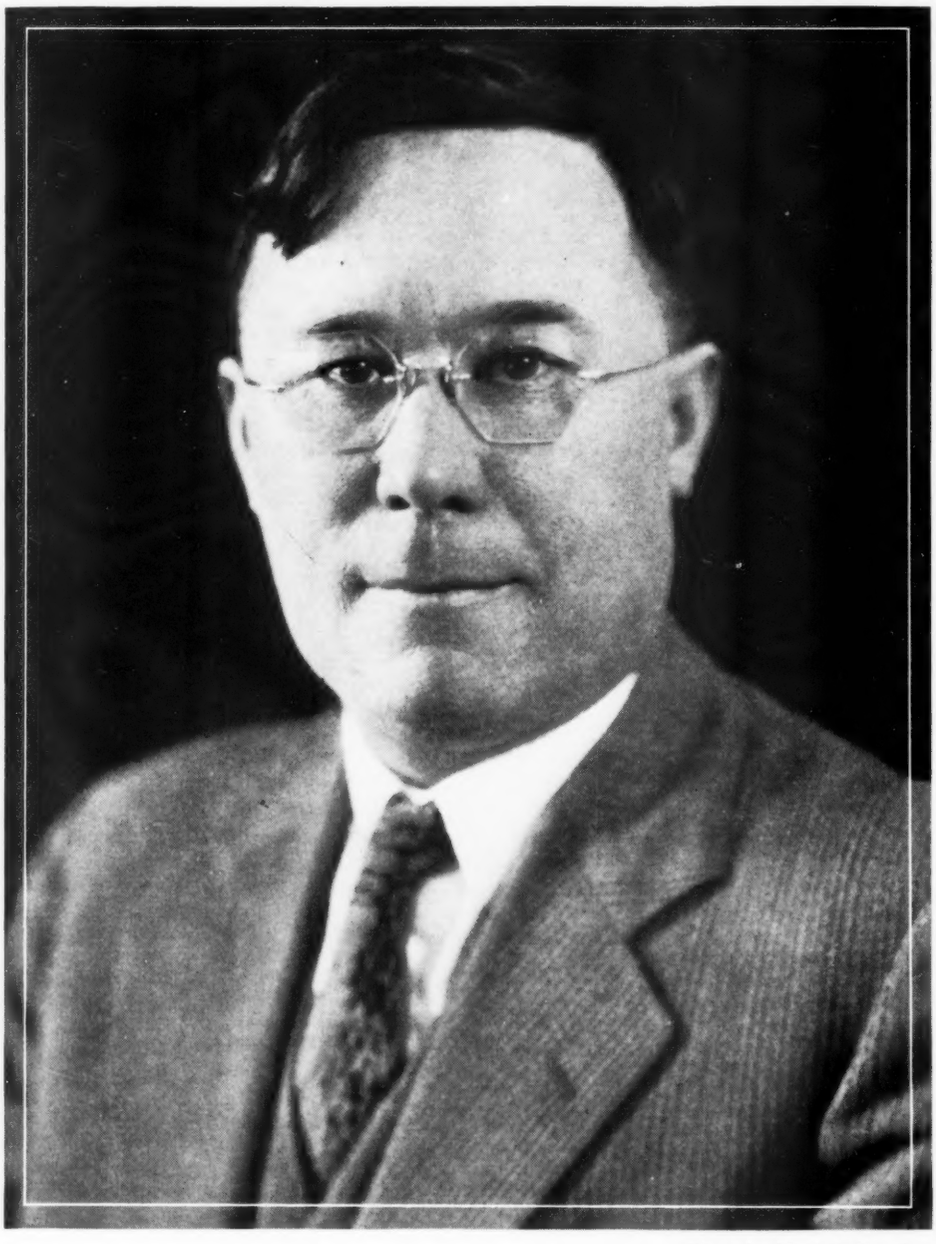

Photo by Blank-Stoller, Inc.

W. R. RAMSEY, president of the Ramsey Petroleum Corp., is one of the outstanding wildcatters in Oklahoma. Originally a banker, Mr. Ramsey came into the oil business years ago and has been highly successful.

Like some other operators he generally follows the policy of selling properties after production has been established and their worth made known. Noteworthy examples of this are his participation in the Allen pool and in the Oklahoma City area, where the company made two large sales of properties in 1929.

With his brother W. E., Mr. Ramsey operated as a partnership for several years. The business was incorporated less than two years ago. An interesting venture at this time is the re-entry of the Ramsey interests into the panhandle of Oklahoma. Three years ago the firm drilled a small oil well in Cimarron county. The territory was dormant, following the completion of a dry hole in the area, until a few weeks ago when the Ramseys took over a large block of state lands and will do further exploratory work in this wildcat area.

Mr. Ramsey lives in Oklahoma City, where the offices of the company are maintained.

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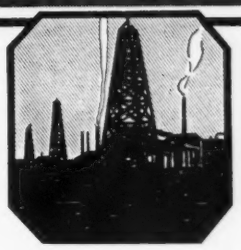

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Vol. 22 **CLEVELAND, April 9** **No. 15**

Insulls Announce Natural Gas Lines To Chicago, Details Due Soon

CLEVELAND, April 8

ANNOUNCEMENT of details of a natural gas pipe line from the Texas Panhandle to Chicago and other communities of the Great Lakes region, is expected almost hourly following a preliminary general statement of the proposed natural gas distributing project made April 2 by the Insull interests of Chicago.

The new line will be approximately 1300 miles long and at the beginning is to have a capacity of 100,000,000 cubic feet of gas daily to Chicago.

Besides the Insull interests which will distribute the gas through its middle western utilities companies, Cities Service Co., Standard Oil Co. of New Jersey, The Texas Co., Phillips Petroleum Co., Skelly Oil Co., and Columbian Carbon Co. are interested in the project. According to the Insull statement, construction of the line will be in the hands of Henry L. Doherty & Co., managers of the Cities Service oil and utilities properties.

At Kansas City, to which point the pipe line system is expected to have a capacity of 300,000,000 cubic feet daily, there will be connections with the Cities Service gas distributing systems in the middle west.

No estimate of the probable cost of the line has been given by the participating companies but unofficial estimates have placed the cost in excess of $100,000,000.

The line at its source will tap the natural gas lands of the oil companies participating in the project. These lands are estimated to contain a reserve of at least four trillion cubic feet of gas.

"This reserve is equivalent in volume, practically, to the 1929 output of manufactured gas in the city of Chicago for a period of 90 years," said the statement of Insull, Son & Co., which firm is looking after the Insull interest in the project. "In deliverable heat service it is considerably more because of the higher heating value of natural gas. The magnitude of the Panhandle gas field in Texas has not been fully defined, but it is clearly the largest natural gas area ever discovered in any country.

"The companies affiliated for the development of the Panhandle to Chicago project have not only a 'backing' in the Texas field larger than any reserves supporting any other natural gas project, but the route of the proposed pipe line passes through or near natural gas fields of Oklahoma and Kansas."

Insull utilities companies are to widen their markets for the gas in northern Illinois and northern Indiana, Insull, Son & Co. stated, continuing:

"To make the project economically possible from both the financial and engineering viewpoints, the market for gas in the Chicago district will have to be enormously increased. Greater use of gas for industrial purposes, for house heating and for kindred employments, calling for use in considerable volume, are obvious prospective outlets.

"The marketing companies will have to work out the problems involved in this local distribution and utilization. To attain the maximum of economic usefulness for the entire gas supply of the Chicago district, as increased by the coming of natural gas, the natural may be mixed with the available supply of manufactured gas before distribution. This will raise a question of rates—whether rates shall be based on the deliverable hearing value of the gas on volume measured in cubic feet, as at present.

"And this is only one of the problems involved in the project which the marketing companies will have to solve before arranging for a supply of the gas. The initial investment required for this project naturally will be many millions of dollars—how many millions is guess work until engineering details are worked out. The size of main, pressures to be employed, number and character of compressor stations, and so on, are all

Attention Equipment Salesmen

THE head of a large oil equipment manufacturing company calls attention of NATIONAL PETROLEUM NEWS that a man posing as the representative of a concern in Canada planning to build a chain of stations is signing fake orders for equipment and presuming upon the contact thus established with equipment salesmen to pass worthless checks and secure loans. Will equipment manufacturers or oil men approached by such an individual please notify NATIONAL PETROLEUM NEWS, at its Cleveland office at once?

factors affecting the investment cost.

"When the engineering and other details of construction and operation are sufficiently advanced, the general offices of the project will be established in Chicago. Henry L. Doherty & Co., will have charge of the construction."

Reports in New York are that the line will be extended to Detroit but confirmation of this would not be given by the interested companies and an officer of one company in charge of natural gas developments for that company also said statements that contracts for line pipe had been let, were incorrect.

Preliminary surveys and engineering for the line to Chicago have been underway for more than two years, it has been learned.

I. T. I. O. Engineers Harness Wild Well at Okla. City

By Telegraph

OKLAHOMA CITY, April 7

THE wild well of the Oklahoma City pool is no longer wild. Blowing in March 26, the No. 1 Mary Sudik of the Indian Territory Illuminating Oil Co., defied all efforts to control until last Sunday night. With a rock pressure of 2200 pounds and making 100,000,000 cubic feet of gas the well has been spraying the countryside with high gravity crude at an estimated rate of 50,000 barrels a day.

Several attempts were made to shut in the flow and one was temporarily successful. An overshot held for six hours when its packing was so badly sand cut that it was necessary to open the well and remove the appliance.

The device which finally brought about the desired result was a special 7-inch dye nipple. One foot long, the nipple had one inch of cutting threads and two and one-half inches of make-up threads above the dye. Outside the lower end was attached a packing gland minus the packing and over all was clamped a special sectional stabbing guide.

On the upper end of the dye nipple was a Christmas tree connection made up of 9-inch fittings. The major features of this control in ascending order were master gate, Cross "T" with swedge nipples to 4-inch gates, master gate and 10-foot nipple. Both master gates were of 5000 pounds test pressure. Suspended by a wire line from the top of the derrick the entire makeup was swung into place by means of guy lines.

As soon as the dye nipple was resting over the protruding casing of the well, the stabbing guide was removed and six inches of threads were cut. When all threads were tightly engaged no leaks were in evidence. However, the bolts were removed from the packing gland and hard rubber packing inserted thus making the bottom end of the nipple entirely secure.

The whole assembly was anchored with chains and steel straps to the clamps of the 9-inch casing in the cellar. With all gates closed the fittings held and the Mary Sudik was under control.

Though many experts were called into consultation the credit for subduing the well must go to the engineers of the company owning it. The strain and anxiety of the past two weeks has been terrific, but they have literally lived on the job until it was completed.

Lo The Poor Osage

By Telegraph

TULSA, April 7.—The tiniest sale of Osage oil leases held April 5 in Pawhuska, brought in only $28,850 for 5018 acres. Thirty-two tracts were offered and all but three were sold. The highest price paid was $5200 for the northwest quarter of 34-20-10, three miles east of Keystone. Lewis Production Co. was the buyer. With little in the way of new fields in the Osage the crowd was small none of the major companies being represented in the list of buyers.

Van Zandt Potential Now 100,000 Barrels

By Telegraph

HOUSTON, April 6.—The twentieth completion in the cooperatively developed Van Zandt County field brought potential production of this east Texas territory above 100,000 barrels daily over the week end. Exact potentials are uncertain, but with the exception of two or three wells all completions in the field have produced at initial rates varying from 4000 to 12,000 barrels daily. Operators consider a potential estimate of 100,000 barrels conservative.

Completion of the Pure Oil Co.'s pipe line from the field to its Gulf coastal terminal at Smiths Bluff will find the field exploited this spring at the 25,000 barrels daily level called for in the Van field development program. Success of the cooperative development plan may prevent exploitation going materially higher, but any failure in this regard would create a serious crude market influence.

Four other major operators cooperating with the Pure Oil Co. in Van field development have obtained a temporary injunction preventing the Cranfill-Reynolds Co., from drilling a small tract in the southern part of the field but title flaws and vacancies in surveys may create other attacks on unified development. Upon disposition of such attacks may rest the success of cooperative development in the field.

The first producing well on the Mykawa dome near Houston, has been completed by the Humble Oil & Refining Co. in its No. 1 Siadous below 4500 feet. It is making upwards of 80 barrels daily of 39 gravity oil through a gas separator. The well came in making 2,000,000 cubic feet of gas.

Wildcat leaseholds of Maxwell & Turman north of production in the Ector county district of West Texas have been sold to the Skelly Oil Co. of Tulsa, for $600,000 of which $200,000 was paid in cash and the rest in deferred obligations. The deal involved 4522 acres.

Prices of Oil Pipe Cut $4 a Ton

CLEVELAND, April 7.—Prices of tubular steel goods have been reduced $4 a ton by the Continental Supply Co. and the National Tube Co. as of April 1. The price reduction covers line pipe and oil well goods.

The National Tube Co. announcement was: "Effective April 1 National Tube Co. will lower the price of standard black and galvanized pipe extra and double extra strong, also oil line pipe, two points, equivalent to $4 per ton reduction. Price of oil well goods will be reduced about on the same basis."

The Continental simply said it was reducing price of tubular goods $4 a ton effective April 1.

The reduction was followed by newspaper reports of an impending price war between the U. S. Steel Corp., of which National Tube is a subsidiary, and the Bethlehem Steel Corp. and Youngstown Sheet & Tube Co., whose products are marketed by Continental, because of the projected merger of the Youngstown company and Bethlehem. The reports lacked comment by officials of the involved companies.

CLEVELAND, April 5.—The mineral leasing division of the U. S. Geological Survey has issued a ruling that an oil operator holding a prospector's permit to explore for oil and gas on the public domain is entitled to a "B" lease after having obtained an "A" lease. The new order is looked on as lessening previous restrictions materially.

The Editors' Viewpoint

National Petroleum News

A.P.I. Should Analyze Refinery Reports Weekly

THE American Petroleum Institute's attitude towards the refinery curtailment suggestion of the Federal Oil Conservation Board is less active than it might be. Just at this time a year ago, it will be recalled, the Holmes committee of the institute was at work on a refinery curtailment program which was based on holding operations for the rest of 1929 to the scale of 1928.

That program was being worked up enthusiastically until the whole works went on the rocks of an adverse—and unnecessary—ruling from the attorney general's office.

Now, twelve months later, comes the suggestion for a means of accomplishing the same end the institute committee was striving for. And the best the institute can do is to draft a resolution approving the principle of the oil board's proposal.

As time goes on, it becomes more and more apparent that a great deal of education on the part of the oil industry is necessary before the industry will be at the point where it will itself solve the conservation problem, the problem of limiting production of crude and manufacture of gasoline to the general market demand for gasoline and other principal oil products. While considerable has been accomplished in the restriction of crude production in flush areas, it seems that the individual directing the affairs of a company still thinks of the relationship between supply and demand as something intangible and abstract—something apart from the conduct of his own business.

He will recognize a condition of general oversupply for the industry at large and still keep his own company operations on a scale where they contribute to that oversupply, for the purpose of building up his gallonage against the threat of competition either this year or next or possibly five years hence, or because he thinks he can keep his own manufacturing costs down and move his own stuff at a profit even though the market generally goes down.

The same kind of thinking is apparent in other industries than oil; but the general correlating of its operations to market needs is more important for the oil industry than for most others because our industry is dealing with a natural resource, in the management and disposition of which the public is coming more and more to assert its rights. If the industry does not itself solve the problem, it is quite possible the public may take a hand.

It is only within a few years at the most that the education of the individual in the oil industry on supply and demand in the light of current figures has been possible. Now that such figures are available, as collected regularly by the institute itself, it would seem that more could be made of them, in this instance, particularly, supplementing the study now being made by the special committee on petroleum economics appointed by Secretary of the Interior Wilbur, as head of the oil board.

The report of that special committee, soon, to be made public, will consist for the most part, it is likely, of an estimate of the market for the rest of the year for gasoline produced in the various refining districts and the probable supply that will be produced. Once made and published that report will soon be out of date and also out of the minds of a great many in the industry.

In place of simply endorsing the oil board's program and wishing it well, could not the institute take upon itself the work of carrying along the study of petroleum economics now being made by Secretary Wilbur's committee? The available figures as to production, consumption and stocks could be analyzed in detail and in the light of changes in the situation taking place from month to month, or at some regular periods.

Such an undertaking by the institute would help carry on the general education of the industry. It would help develop the thinking of the individual executive to the point he would realize the conditions portrayed can only be remedied as he applies the remedy to his own company's operations.

A Real Accomplishment

PRESIDENT KINGSBURY of the Standard Oil Company of California, is entitled to a gold medal for getting a decent story on the oil industry from Arthur Brisbane, famous Hearst editor. This comment Brisbane sent out as his column to newspapers all over the country last week. Mr. Kingsbury evidently took Mr. Brisbane on an airplane trip over the fields and not only got into Brisbane's head the facts, but in some way prevailed upon Brisbane to stick to the facts when he wrote about it.

Sticking to the facts is a hard thing, seemingly, for the average Hearst employee to do, especially when he is writing about big business. Hearst publications have been careless to say the least, when it comes to facts. Brisbane, since he has gotten accustomed to all of his tremendous wealth, has probably got a little more conservative view than he had in years past.

One of the curses of industry today is the carelessness and indifference of newspapers to facts in regard to business. Every empty-headed blowhard, such as Senator Blaine from Wisconsin, Brookhart from Iowa and LaFollette from Wisconsin, and men of that type, can get columns of space in the newspapers on unsupported statements and statements that are far from the facts and which these men oftentimes know are far from the facts, and yet it is looked upon as a crime if business tries to get the facts in a newspaper.

Therefore, whoever has achieved getting the facts and nothing but the facts from a Hearst man is entitled to the thanks of his industry.

National Oil and Auto Leaders To Address N.P.A. Meeting

CLEVELAND, April 8

A NUMBER of nationally known leaders in the automobile and oil industries will speak before the semi-annual meeting of the National Petroleum Association at Cleveland, April 23 and 24, announced Fayette B. Dow, general counsel of the association. Meetings are to be held at the Hotel Cleveland.

C. F. Kettering, president of the General Motors Research Corp., one of the most far-seeing engineers of our era, is to be one of the principal speakers on the program. Mr. Kettering will discuss some of the most important common problems of the manufacturer of automotive equipment and the petroleum refiner. Opportunity will be given refiners to ask the speaker any questions they may wish to put to him. Mr. Kettering has a wide reputation as a speaker who is capable of thrilling his hearers with his practical vision of the future for the automotive industry.

Another speaker from the automotive field will be Alfred Reeves, general manager of the National Automobile Chamber of Commerce. His talk is to be on "Advantages that Come from Co-operation in the Motor Industry."

Accomplishments of the automobile manufacturers through their joint efforts makes a remarkable story which never has been fully told to our industry, Mr. Dow says. Mr. Reeves is in a position to tell the facts fully.

E. B. Reeser, president of the American Petroleum Institute and head of the Barnsdall Corp., is another of the industrial leaders who will appear before the association. He is to discuss frankly the present problems of our industry and point out the progress which has been made in the past year in which more and more attention has been paid to fundamental economics.

E. M. Lyons, president of the association and head of the Tiona Refining Co., will open the convention with a discussion of the common problems of the eastern refiner.

A. M. Maxwell, vice-president of the Standard Oil Co. of Ohio, will speak on marketing. As head of the marketing division of that company he has been in charge of the reorganization of its policies resulting in tremendous increases in business, particularly in the sale of premium products.

Warrent C. Platt, editor of NATIONAL PETROLEUM NEWS, is to address the meeting on the economic problems of our industry.

Technical papers on refining subjects have been prepared for presentation by three engineers. H. S. Bell, petroleum engineer and author of books on refining, will present an illustrated paper on "Developments in Foreign Refining."

C. F. Kettering

D. G. Brandt of Henry L. Doherty & Co., will discuss "Modern Trends in the Manufacture of Lubricants."

H. G. Dunmire of the Valvoline Oil Co., will present a paper on "Crystallization of Wax in Paraffin Distillate."

A first aid contest will be staged during the convention under the leadership of James H. Herbert, president of the Fire and Safety Marshals of the National Petroleum Association. The Conewango Refining Co. and the Independent Refining Co. teams will compete.

Discussions of various activities of the association will be given by trustees in charge of the departments. These will include O. P. Keeney of the department of standards and tests, who also is chairman of the program committee; N. H. Weber of the department of trade and commerce; P. S. Tarbox of the department of manufacture; Commander G. C. Davison whose special interest is research in manufacture, and R. A. Wotowitch of the department of fire prevention and safety.

Houston Dunn, manager of the National Petroleum Mutual Fire Insurance Co., will speak and Willis Crane, traffic attorney for the association, will report on transportation matters.

Fred G. Clark, president of Fred G. Clark, Inc., who is in charge of entertainment, has arranged for the usual fellowship supper to be held at the Hermit Club the evening of April 23. There are to be no speeches or professional entertainers at the fellowship supper.

In view of the excellence of the program which has been arranged Mr. Dow is suggesting that members and visitors make early hotel reservations.

S.O. New York to Advance Tankwagon One Cent

NEW YORK—On April 9 Standard Oil Co. of New York will advance tank wagon and service station prices of gasoline 1 cent throughout its territory, which includes the states of New York, Massachusetts, Maine, New Hampshire, Vermont, Connecticut and Rhode Island.

Last previous general change was a 1 cent cut on tank wagon only Feb. 11, and 1 cent cuts at various points in New York Feb. 17 and 19.

Texas Co. to Market Ethyl Nationally

CLEVELAND, April 7.—The Texas Co. expects to have in operation by about May 15 the distribution of Ethyl gasoline throughout the United States. This will be the widest distribution of Ethyl in the country as The Texas Co. is one of only two companies which have nation-wide distribution of motor fuel. The other company is the Shell which does not sell Ethyl.

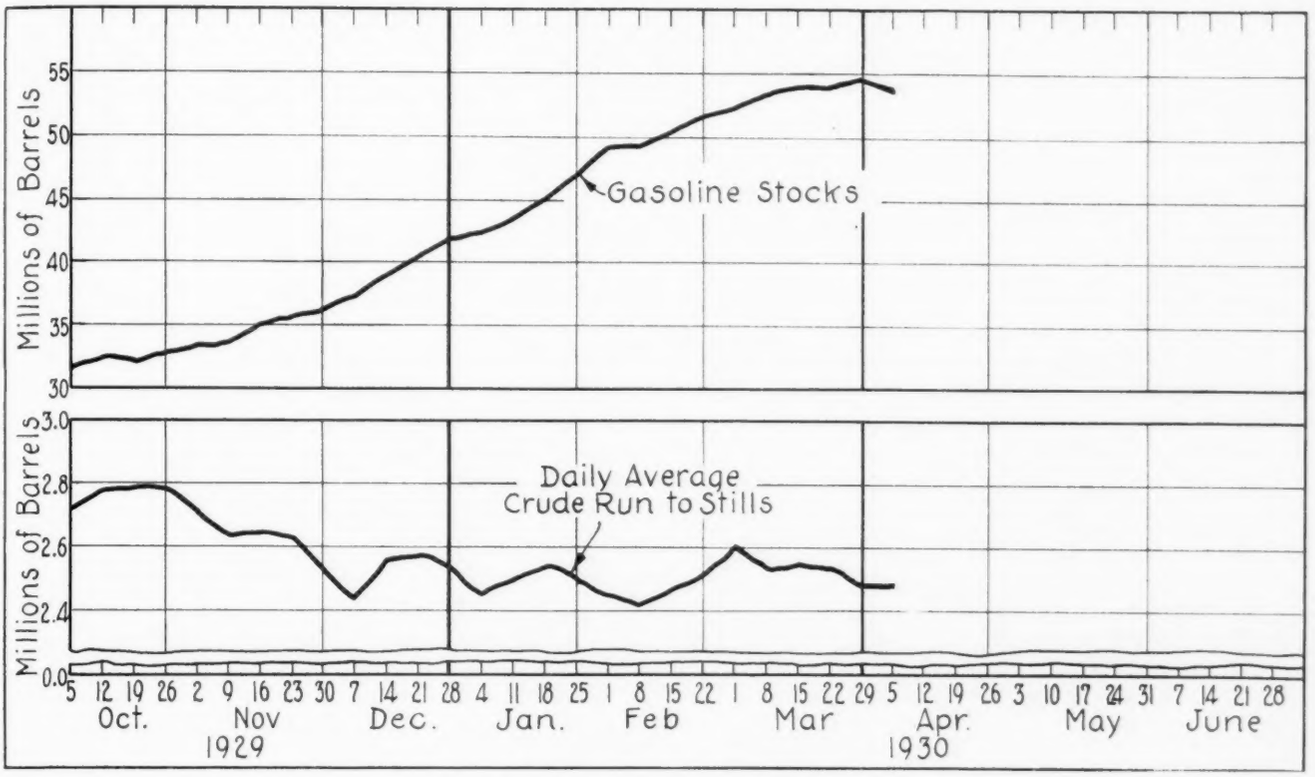
Work of putting in tanks for Ethyl gasoline at approximately 20,000 marketing outlets of The Texas Co. has been underway for about six months, it was said at the company's headquarters in New York, and distribution has already begun on the Pacific coast.

Blending will be done at most of the Texas refineries which are scattered from coast to coast.

* * *

NEW YORK, April 5.—Lion Oil Refining Co., El Dorado, Ark., has been licensed to blend and sell Ethyl gasoline by the Ethyl Gasoline Corp.

CASPER, Wyo., April 5.—Laurel Oil & Refining Co. is putting finishing touches on its new refinery at Laurel in southern Montana. It is to operate on Oregon Basin crude.



U. S. Crude Runs and Gasoline Stocks

Million Barrel Cut in U. S. Gasoline Stocks

By Telegraph

NEW YORK, April 8

STOCKS of gasoline at U. S. refineries were reduced almost a million barrels in the week ended April 5 according to reports gathered by the American Petroleum Institute from plants with 95.6 per cent of the capacity of the country. Total stocks of motor fuels April 5 were 53,808,000 barrels as compared with 54,739,000 barrels the previous week.

California refiners made the largest draft on stocks during the week, drawing 406,000 barrels from storage to meet current demands. California stocks at the close of the week were 15,784,000 barrels.

Texas refiners drew 284,000 barrels of gasoline from storage bringing their stocks down to 7,869,000 barrels. Oklahoma and Kansas refiners drew 194,000 barrels from storage cutting gasoline stocks to 4,506,000 barrels. East Coast refiners drew 9000 barrels from storage. Other refining groups added small amounts to their reserves.

Crude runs at reporting plants were almost identical with those reported in the week ended March 29, dropping only 1500 barrels daily average to 2,489,300 barrels per day. This represented 70.9 per cent of the capacity of reporting plants.

East Coast refiners decreased their crude runs 25,300 barrels daily average during the week to 471,100 barrels per day. This brought their operations up to 77.8 per cent of capacity, well above the national average. Rocky Mountain refiners increased their runs 8200 barrels daily average and California plants increased runs 9000 barrels daily average.

Indiana-Illinois refiners cut their runs back 20,000 barrels daily average after their big increase of the previous week but still were running at 82.5 per cent of capacity with their throughput of 307,700 barrels per day.

Oklahoma-Kansas refiners cut their runs 13,200 barrels daily average and Texas refiners cut their runs 12,700 barrels daily average. A cut of 3500 barrels daily average was reported by Appalachian refiners.

Current Refinery Operations

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels)			
		Apr. 4	Mar. 29	Apr. 4	Mar. 29	Gasoline Apr. 4	Gasoline Mar. 29	Gas & Fuel Oil Apr. 4	Gas & Fuel Oil Mar. 29
East Coast	100.0	471,100	445,800	77.8	73.6	9,341	9,550	6,348	6,314
Appalachian	91.0	88,500	92,000	75.9	78.9	1,870	1,865	697	668
Ind.-Ill.-Ky	99.5	307,700	327,900	82.5	87.9	8,601	8,479	3,036	3,056
Okla.-Kans.-Mo	89.1	300,400	313,600	73.0	76.2	4,506	4,700	3,593	3,622
Texas	90.4	544,700	557,400	76.4	78.2	7,869	8,153	10,868	11,072
La.-Ark	96.8	168,600	163,000	64.4	62.2	2,765	2,553	2,031	2,008
Rocky Mountain	93.6	63,100	54,900	45.3	39.4	3,072	3,049	1,069	1,059
California	99.3	545,200	536,200	61.2	60.2	15,784	16,390	108,690	108,387
Total U. S.	95.6	2,489,300	2,490,800	70.9	70.9	53,808	54,739	136,332	136,186
Texas (Gulf Coast)	99.4	409,600	423,400	78.2	80.9	6,772	7,076	8,401	8,490
La. (Gulf Coast)	100.0	103,400	107,400	70.1	72.8	2,412	2,207	1,225	1,174

Shell Sues Penn Oil Co. For Not Selling Out

WASHINGTON, April 7

ALLEGED failure of the Penn Oil Co., Paul and Annie Himmelfarb, and the Penn Realty Co. to carry out a contract of sale has caused the Shell Eastern Petroleum Co. to sue the Penn interests for $100,000 of liquidated damages in the supreme court of the District of Columbia.

Shell alleges that the Penn interests contracted last November to convey 52 service stations in the District of Columbia and a bulk station at Rosslyn, Va. not later than Jan. 3, 1930, but failed to do so. It also alleges that $100,000 was agreed upon as damages to be paid for the failure of either to carry out the contract. The conveyance was to be by lease with an option to buy attached.

The Penn defendants are accused of delaying or deferring preparations to such an extent that the contract could not be complied with by the date specified. The Shell company alleges that it was damaged by reason of the failure in the manner specified.

The Shell company went so far, at the time the transfer was expected to be made, as to stage a parade of its equipment through the down town streets of the capital. At the time the transfer was supposed to be made Paul Himmelfarb, president of the Penn company told NATIONAL PETROLEUM NEWS that the negotiations had not been completed.

About a month ago the American Oil Co. acquired the Himmelfarb stations and now it is changing them into Lord Baltimore filling stations for the handling of American Oil products under the filling station trade name.

Failure of the Himmelfarb negotiations, however, did not keep the Shell interest out of Washington. The Shell Eastern Petroleum Co. bought several stations soon after the Himmelfarb negotiations and announced that it would acquire others as opportunity presented.

Kendall Heads Houston Refinery of Sinclair

HOUSTON, April 3.—Parker Kendall, for the last two months acting superintendent of the Sinclair Refining Co. plant on the Houston ship channel, has been appointed superintendent, according to advices from New York headquarters. He succeeds John W. Duckett, who was recently transferred to New York in an executive capacity under George H. Taber, Jr., vice president of the Sinclair Refining Co.

Shifts in the Sinclair organization brought Harry L. Pelzer of the East Chicago technical department to Houston as the assistant superintendent, taking the post Mr. Kendall vacated. W. Johnson was made general refinery foreman in charge of operations, a newly created position at Houston.

Mr. Kendall, who came to Houston ten years ago from East Chicago, where he had been chief clerk, was successively night superintendent, foreman of stills and assistant superintendent before his promotion. He was educated in the law department of the University of Chicago, but took up refining studies after a few years with an East Chicago construction company.

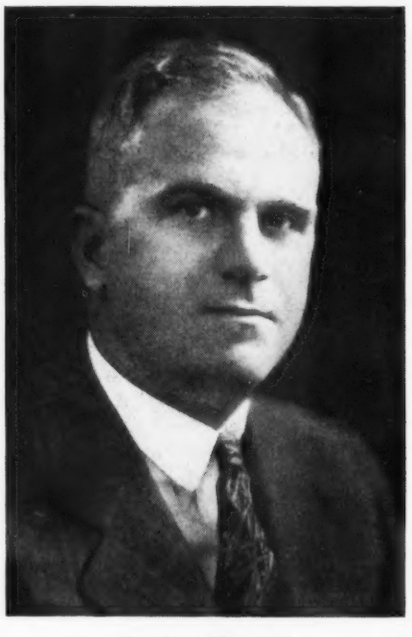
All-Business Program For Indiana Jobbers

INDIANAPOLIS, Ind., April 7.—Four oil men and three politicians will keep the jobbers who attend the one-day spring convention of the Indiana Petroleum Association on April 24, interested in the code of ethics, inspection fee and the proposed constitutional convention.

The convention will be at the Hotel Severin at Indianapolis, according to Max L. Wickersham, executive secretary.

Speakers are Paul E. Hadlick, secretary of the division of marketing of the American Petroleum Institute; Frank E. Packard, general counsel, Standard Oil Co. of Indiana; Herbert F. Davis, president, Indiana Petroleum Association; Thomas J. O'Day, president, O'Day Oil Co., and vice president of the association; H. H. Evans, state representative; Phillip Zoercher, state tax commission; and A. N. Bobbitt, auditor of state.

There will be no registration fee, no banquet, no entertainment, just a day of serious consideration of the oil man's problems, Mr. Wickersham says.



Parker Kendall

Report Doherty Options German Oil Lands

NEW YORK, April 5.—Cities Service Co. and Henry L. Doherty & Co. has optioned the control of the North European Oil Corp. which has leases on 2,000,000 acres of prospective oil land in Germany, according to a story in the New York Times. Doherty officials have made no statement about the options.

Small quantities of oil have been produced in Germany for years but deep drilling has never been resorted to in an effort to increase recovery. It is the belief here that the Doherty interests plan deep drilling like in the Oklahoma City field where large production was attained after the field was condemned following the drilling of relatively shallow dry holes.

U. S. May Fix Oil Price On Public Lands

By Telegraph

WASHINGTON, April 7.—The Court of Appeals of the District of Columbia today decided that the Secretary of the Interior had the power to fix the price at which crude oil produced on land owned by the government had to be sold. That power comes from the secretary's duty to make regulations.

The court decided that Secretary Wilbur was within his powers when he refused to approve a contract made by the Cody Petroleum Co., to sell oil from the Oregon basin in Wyoming to The Texas Co., for 53 cents per barrel. Secretary Wilbur refused to approve the contract except at a price of 85 cents per barrel which The Texas Co. contended was beyond his power to make.

CASPER, Wyo., April 5.—Maple Leaf Refining Co. has resumed operations at its plant at Coutts, Alberta, about eight miles from the new international oil field in Montana and Alberta.

Budgeting Gasoline Output to Sales Profitable for Ohio Standard

CLEVELAND, April 5

PROFITABLE operation can be attained by refineries if they will budget their gasoline production to their profitable sales possibilities and not just make gasoline, W. T. Holliday, president of the Standard Oil Co. of Ohio, intimates in his annual report to stockholders.

The Ohio company, Mr. Holliday writes, has held its output to what it can sell profitably and by so doing turned its inventories 15½ times in 1929.

However, Mr. Holliday contends the over-production of gasoline is a superficial factor in the economic status of gasoline markets and the fundamental factors are over-production of crude oil, over-production of refining capacities and over-production of marketing competition.

He points out that a large part of the over-supply of gasoline is far from the industrial consuming centers of the central states and the east. Refiners in the latter territory, having their own marketing outlets, are in much better position than those refiners west of the Mississippi river who have to depend on tank car sales to move their products.

He sees little hope for the effort to budget the industry's gasoline production by a one-seventh curtailment but believes each refining company can help the industry by budgeting its output to profitable sales. He argues there is little necessity for building large inventories of gasoline in winter months because of the present flexibility of refinery production.

W. T. Holliday

He points out that his company in 1929 ran 28.2 per cent more crude oil than in 1928 and the gasoline production was increased by 1.5 per cent of the crude run as compared with the 1928 runs. Total gasoline of the company was 31.9 per cent more than the 1928 production. The increase was attained without adding any crude stills. Two additional cracking stills, however, were completed and put into operation, and the company bought and reconstructed a refinery at Latonia, Ky., in the Cincinnati switching district.

Mr. Holliday's observations on the general economic aspects of the gasoline situation, written under the subheading, "Problem of Industry's Gasoline Over-production," follows:

"Much has been said and published in the last year about the industry's over-production of gasoline, and in view of the fact that your own company has been increasing its refining capacity, the question may arise in our stockholders' minds as to whether this company might properly be subject to censure upon the ground that it is failing to make proper contribution to the solution of that industrial problem.

"We would like to say first of all that this company has not built a single new crude still in the last eight years, but has dismantled many. Its increase in refining capacity has been a by-product of modernization and increase in speed of operation.

"In 1929 your company's merchandise inventory turned over about fifteen and one-half times. Your company does not make gasoline and then try to sell it. Through its budget it knows what its minimum sales will be, and its problem is how to get enough gasoline of proper quality and at profitable cost to meet its sales requirements.

"By the beginning of December, 1929, your company had reduced its refinery crude runs by about 40 per cent from its peak months runs of 1929, as contrasted with a reduction on the part of the industry as a whole of only about 11 or 12 per cent. The reason for this reduction by your company was not merely because of the state of inventories of the industry as a whole but because, with modern flexibility of refinery operation, it is not necessary for us to accumulate as large inventories in the winter months to take care of the peak demand in the summer as it used to be a few years ago. This is true also of the industry as a whole, and perhaps failure of refining companies to recognize this fact may be partly responsible for the industry's present excessive stocks.

"The total refining capacity of the United States is now in excess of the requirements of the peak demand in summer, and there is no longer the need or justification for accumulating such large stocks of gasoline in the winter months.

"We believe that your company has done more than its share in the holding down of its inventories and crude runs. At this time, however, high government officials are reported as suggesting to the refining part of the industry that it further arbitrarily reduce its crude runs by one-seventh. No such sweeping generalization can be expected to be put into effect. It would penalize those who already have exercised business conservatism to the benefit of those who have been reckless in their production of gasoline.

"It would seem pertinent to inquire, as few general considerations of the problem have inquired, where the excessive inventories are located, and of what kind of gasoline they consist. We suggest that such inquiry would show that the excess inventories lie west of the Mississippi River, far

from the industrial sections of large demand, and that, to a very considerable extent at least, the excess is ordinary U. S. Motor gasoline.

"At the beginning of 1930 about one-third of the country's gasoline stocks was located in California. About 30 per cent was in Oklahoma, Kansas, Missouri, Texas, Louisiana and Arkansas. Only approximately 31 per cent of the total stocks was located east of the Mississippi River, and of this only about 17 per cent was located between the Mississippi and the Atlantic Seaboard refineries.

"The refineries in the central states, in which group your company's refineries are located, ended the year 1929 with gasoline inventories lower than in December, 1928, whereas gasoline inventories of the industry as a whole on Dec. 31, 1929 were about 30 per cent in excess of those at the end of 1928. These central states refineries, as a class, are marketers through their own outlets and many of them are buyers as well as manufacturers of gasoline.

"One of the causes of over-production of gasoline, as we see it, is that there are two classes of refineries: those that make gasoline to meet their sales requirements and those that just make gasoline. For the most part the former are refining companies which have their own marketing outlets, and the latter are refineries which rely primarily upon wholesale tank car sales.

"Advertising of trade brands and acquisition of existing marketing outlets by refiners having their own marketing systems have been taking markets away from the refineries relying upon wholesale sales. This element of marketing competition, in our judgment, is an important factor in the existence of the present surplus stocks of gasoline and will continue to increase in importance.

"The refining companies having their own marketing systems can hardly be expected, at least for any extended period, to turn over their increase in sales to the unintegrated refineries. In fact, many of them could hardly do so if they desired because of the growing tendency heretofore noted for the backing up of advertised brands with a product of special quality. Such special quality cannot usually be purchased on the open market and the need for it puts additional pressure upon retail marketing refineries to produce their own gasoline.

"An entire industry, like the gasoline business, cannot reasonably be expected to budget itself as a whole. The budgeting has to be done by the individual companies in accordance with their own reasonable expectations of sales. Marketing companies having refineries, we believe, are budgeting their production of gasoline in accordance with their sales requirements, and it is reasonable to expect that they will continue themselves to manufacture the quantity and quality of gasoline needed to meet their sales requirements.

"The pressure upon inventories of such companies comes from their increasing sales. They may be justly criticised for making uneconomical extension of sales, as for example, shipping beyond economical freight rates; but they can hardly be expected to relax their efforts to increase profitable sales. Any rationalization of the industrial situation must take into cognizance the economic urges, and it cannot reasonably be expected that people will stop manufacturing their own requirements in order to buy from others.

"In conclusion, therefore, while the immediate cause of surplus gasoline inventory is over-production of gasoline, the underlying causes are over-production of crude oil, over-production of refining capacity, *and* marketing competition. Any effort to remove the superficial cause, to-wit, over-production of gasoline, can be only of temporary effect so long as those fundamental causes remain.

"The management of your company believes in industrial co-operation, so far as is legal and practical, and always is glad to make its fair contribution thereto. Much good can be accomplished in an educational way through proper co-operation. We feel, however, that your company has done all that it can reasonably be expected to do when it operates upon a careful budget and produces or purchases only such quantity and *quality* of gasoline as is needed for its sales requirements.

"All companies, however, cannot be expected to operate upon such a budget basis. It is contrary to human nature. Companies having refineries and no definite assurance of sales will continue to manufacture and attempt to force their goods upon the market by price cutting so long as they can."

Curtin Is Mid-Continent Division Sales Head

CHICAGO, April 4.—J. D. Curtin, recently promoted to the position of sales manager of the southern division of the Mid-Continent Petroleum Corp., Tulsa, Okla. Mr. Curtin has been assistant Chicago division sales manager of the Mid-Continent Co. for the past two years. Prior to this, he was a salesman in the Iowa and Wisconsin territories.

Mr. M. H. Duffield will take Mr. Curtin's place as assistant Chicago division sales manager. Mr. Duffield has been with the company for the past 10 years.

J. D. Curtin

Shell Acquires Southern Petroleum

ST. LOUIS, April 4.—A bulk plant of 60,000 gallon capacity, 13 service stations and offices of the Southern Petroleum Corp., Memphis, were purchased April 1 by the Shell Petroleum Corp.

All of the Southern company's property is in Memphis. The deal also included nine rural and industrial wholesale consumer accounts. The Shell company has made Memphis its main distributing point for Tennessee.

The Southern company was a well known marketer in Tennessee and was headed by W. H. Shubert.

Cochran Heads New S.O. Indiana Division

CHICAGO, April 5.—F. L. Cochran has been appointed assistant general manager in charge of sales in the newly created Rocky Mountain division of the Standard Oil Co. of Indiana. His headquarters will be at Denver.

Mr. Cochran has been manager of sales for the Midwest Refining Co. for several years.

The territory has been divided into three sales divisions, all under Mr. Cochran's supervision, to be managed as follows: Colorado, H. B. Carpenter, Denver; Wyoming, C. H. Goohs, Cheyenne; Montana, C. S. Dines, manager, and B. H. Sinclair, assistant manager, Billings.

CHICAGO, April 5.—Ed. A. Cousino, who recently was put in charge of the Chicago Sales Division of the Security Petroleum Co., Kansas City, Mo., has just been made a Vice-President of the company. His headquarters will be at 310 South Michigan Ave., Chicago. Telephone Harrison 8805.

Review of Late Production News

WITH Oklahoma City adding 22,000 barrels daily to its production the week ended April 5, a 16,250 barrel increase resulted in the country's daily average production, which rose to 2,530,450 barrels, according to the American Petroleum Institute.

Crude oil imports gained 25,715 barrels, daily average, to 201,285 barrels. Total new crude supply for the past week was 2,731,735 barrels, as compared with 2,689,770 barrels the previous week.

Oklahoma's daily output gained 20,600 barrels the past week. East Earlsboro gained 3700 barrels, East Little River 4150 and Sasakwa 2550 barrels. Earlsboro fell 3050 barrels, Little River 2500 and Mission 2400 barrels.

California production fell 11,100 barrels daily average, half of which was in Santa Fe Springs. Long Beach fell 3000 barrels, and Midway-Sunset 2000 barrels.

Voshell pool in Kansas gained 3850 barrels. Van Zandt in east central Texas gained 6000 barrels. Eastern fields, outside of Michigan, gained 2500 barrels.

There were decreases of 3850 barrels in Refugio county, 2650 barrels in Yates and 1250 barrels in Winkler county.

California

ACCORDING to estimates of daily average production in California for week ended April 5, voluntary curtailment combined with actual enforcement of the gas conservation law at Santa Fe Springs had reduced the state's output to 610,800 barrels or to within approximately 7000 barrels of the new potential of 603,289 barrels recently set by the Fact Finding Committee.

Potential production at Santa Fe Springs has been reduced from 232,140 to 208,921 barrels per day and the allowable for April has been set at 119,085 barrels as compared with a previous figure of 132,320 barrels. Actual daily production in this field during the past week was 128,500 barrels and is expected to be down to 115.000 or 120,000 during the coming week. Present production for this field is the lowest since 1926.

Although several completions were recorded at Signal Hill during the past week, curtailment measures had reduced the field's output to 99,600 barrels per day. Three or four operators at Santa Fe Springs with aggregate daily production of 12,000 barrels have indicated their intention of forcing the state to stop natural gas wastage from wells on the leases held by these companies. Their position in regard to this outlook was strengthened during the past week when Wilshire Oil Co.'s Off 18 on the Bandini lease burst through a valve and caught fire while being beaned in.

Current production in this country by pools is found on page 113.

Oklahoma-Kansas

INTERESTING and important wildcats marked the progress of the Mid-Continent during the past calendar week, with the Panhandle of Texas taking the lead. In that area, Moore county had one in the north central part that may indicate the presence of a new pool, while Collingsworth county made its first producing hit near the town of Shamrock.

Most of the excitement in Oklahoma centered around the wild well in the Oklahoma City pool. The situation there is decidedly serious and everything that can possibly be done to curb the well is being tried. At this writing however, it is still spraying the countryside and 147 wells are shut down by order of the state fire marshal.

Siliceous lime production, which was found last week in the Voshell pool of McPherson county, Kansas, has boosted the production to 30,000 barrels, or double the pipe line capacity. Proration is on again. In Edwards county a new wildcat gives promise of a pool there while in McPherson county a well located six miles north of the Ritz pool came in for 200 barrels from the chat.

Texas, New Mexico, Louisiana

CONSTRUCTION of pipe line facilities into the Hobbs field of Lea county, New Mexico, which a week ago were branded premature, are now definitely announced. Humble Pipe Line Co. will extend from Jal, N. M., also in Lea county, a distance of 40 miles to Hobbs, building an 8-inch feeder for its existing salt basin facilities. Atlantic Pipe Line Co. is starting preliminary work on an 8-inch welded line, 70 miles long, from Midland, Texas, to Hobbs.

The seventeenth and eighteenth wells in the Van Zandt area of East Texas are listed among current completions. One of them, No. 1 B. M. Fowler on the Van townsite, was estimated good for 9000 barrels initial production at 2888 feet and the other, two locations west of the Pure Oil Co.'s field discovery, was rated at 12,000 barrels at 2875 feet. Both were pinched promptly, the cooperatively developed field still being exploited at only approximately 15,000 barrels daily for all wells.

Wyoming, Montana

A MILE extension to the southeast has been proved in the new border field lying partly in Montana and partly in Alberta by the Monalta Oil Co.'s Buckley No. 1 which has 1500 feet of oil coming from the Vanalta sand. Several new wells are under way on both sides of the international line.

A deep test in the North Casper Creek field, central Wyoming, is to be drilled by the All States Oil & Gas Co. which controls the producing area. Test will go to the Madison lime. Railroad spur to the field is being laid by North & South railroad and shipments of crude to a Casper refinery are to be started upon its completion.

Gas discovery well at Payette, Idaho, blew out for the third time last week while a third attempt was being made to clean it out and test the production.

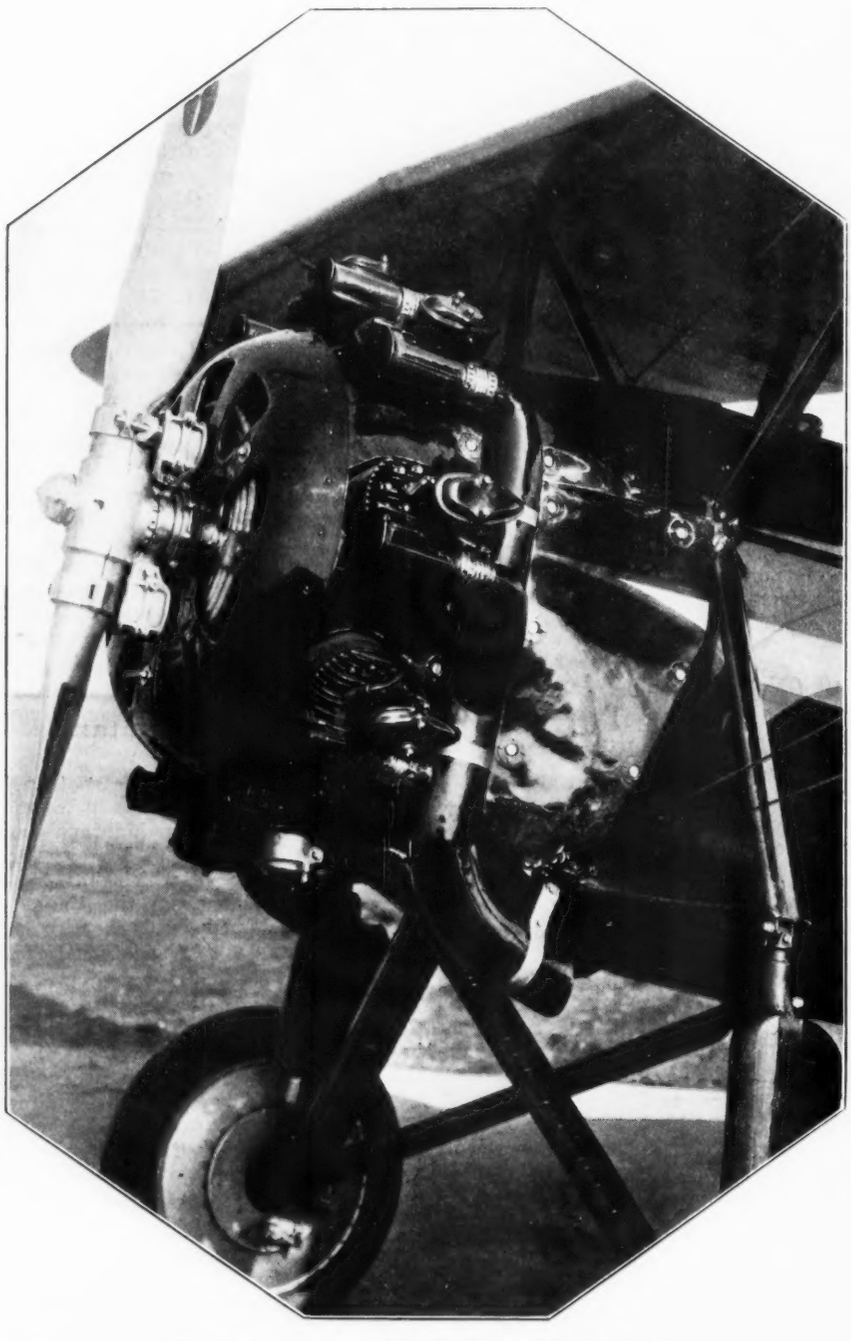
New Packard Diesel Aircraft Engine Obtains Fuel Economy

CLEVELAND, April 8

DETAILS of construction and operation of the Packard Diesel aircraft engine were first made public by L. M. Woolson, the designer, at the meeting of the Society of Automotive Engineers in Detroit today, in connection with the All American Aircraft Show.

It was predicted that large transport, mail and freight planes will be driven by either a single Diesel engine of large power, or possibly by two smaller engines mounted on the wings of the plane so as to remove the source of noise from the passenger compartment.

A few days ago it was announced that the first test flight of a Ford tri-motored plane, equipped with Packard Diesel engines, had been made at the Ford airport near Detroit.



Plane equipped with Packard Diesel motor

It was announced that the Packard Diesel engines will be optional equipment on the Ford 4-AT transports which are regularly powered with Wright J-6 engines. The Packard engines give the planes a total of 660 horsepower, while the Wright engines provide 900 horsepower.

Advances in the construction of Diesel type engines, as embodied in the new Packard engine, were described by Mr. Woolson as the extension of the range of engine speeds possible with the Diesel cycle, and radically new methods of engine construction which have reduced its weight to practically the same level as that of gasoline aircraft engines of equivalent power. The Packard engine weighs 2.5 pounds per horsepower.

Formerly, high speed Diesel engines of modern type have been limited to a maximum speed of about 1200 revolutions per minute, it was said, while in the Packard Diesel this speed has been increased to over 2000 revolutions per minute.

The important weight economies were secured by the elimination of carburetors and magnetos and by intense simplification of design, including a one-piece crankcase and the single valve arrangement which automatically halves the number of parts required for valve operation from what is found in conventional gasoline engines.

The Packard Diesel engine has been run with many different kinds of fuel, it was announced and it was said that fuel specifications could be very broad. Domestic furnace oil of about 37 Be. gravity costing about 9 cents a gallon was found to be highly satisfactory. The oil must have a low enough pour point to flow at 20 degrees below zero F.

It has been estimated that the fuel consumption reduction in weight in the Diesel engine, as compared with that of a gasoline engine, represents a saving of 20 per cent and, due to the higher specific gravity of the fuel used, a saving of over 30 per cent by volume is effected. Additional fuel savings result through the lower cost of the fuel as compared with gasoline and the higher efficiency of the Diesel principle.

Ground and flight testing with the Packard engine proved that it

was impossible to ignite accidentally the fuel oil used in the engine, since it is practically essential to atomize this fuel into a very fine spray before it can be ignited at all.

The following description of the engine and its operations was given by the Designer L. M. Woolson.

By L. M. Woolson

THE Packard Diesel aircraft engine is of the radial air-cooled type having nine cylinders with a bore of 4 3/16 inch and a stroke of 6 inches giving a displacement of approximately 980 cubic inches. The engine is rated at 225 horsepower at 1900 revolutions per minute and weighs 510 pounds or 2.26 pounds per rated horsepower.

The outside diameter of the engine is slightly over 45 inches and the engine is attached to the mounting ring with eight ⅜-inch bolts arranged on a bolt circle of 22 inches diameter. It will therefore be seen that so far as its general characteristics are concerned with relation to size, weight and general arrangement the engine does not differ radically from conventional gasoline aircraft engines of a similar type. This comparison, however, holds good only in so far as general external appearance is concerned since the engine incorporates many constructional features never before employed in aircraft engines.

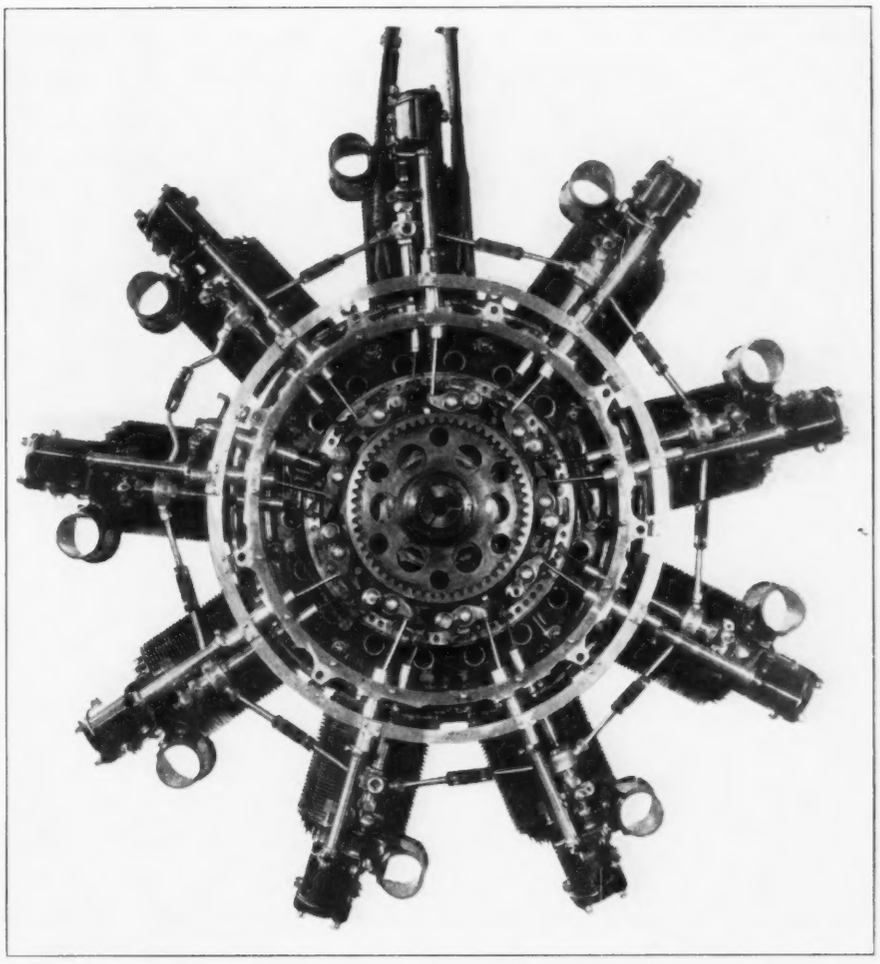
A casual inspection reveals a radical departure from current practice in that each cylinder is supplied with only one valve which serves as both inlet and exhaust and the single rocker arm box which is slanted in the direction of the spiral of the slip stream contributes considerably to the clean external appearance of the engine and what is more important to its low parasitic drag.

The Diesel Principle

As the new Packard engine operates on an entirely different principle than the gasoline engines used heretofore in aircraft it is desirable before launching into a mechanical description of the engine to consider first in a general way the principles of operation of the Diesel cycle as opposed to the Otto cycle principle on which nearly all gasoline engines operate.

The real point of departure between the two systems of operation is the ignition system involved. In the gasoline engine an electric spark is depended upon to fire a combustible mixture of gasoline vapor and air which mixture ratio must be maintained within fairly narrow limits in order to be fired by this method. Generally speaking, a maximum variation of 2:1 is permissible; that is to say, the ratio of air to gasoline by weight may vary from about 10:1 to 20:1 and richer or leaner mixtures than these will fail to fire regularly in the gasoline engine cylinders.

In the Diesel engine pure air is introduced into the cylinders, instead of a mixture of air and fuel as in the gasoline engine, and this air is compressed into a much smaller space than is possible using a mixture of gasoline and air which would spontaneously and prematurely detonate if compressed to this degree. The temperature of the air in the cylinder at the end of the compression stroke of a Diesel engine operating with a compression ratio of about 16:1 is approximately 1000 degrees F. which is far above the spontaneous ignition temperature of the fuel used.



Rear view of Packard airplane Diesel motor with crankcase cover removed to show operation of fuel injection pumps and valve connections

When the fuel is injected in a highly atomized condition at some time previous to the piston reaching the end of its stroke the fuel burns as it comes in contact with the highly heated air and the greatly increased pressures resulting from the tremendous increase in temperature brought about by this combustion, acting on the piston, drive the engine as in the case of the gasoline engine.

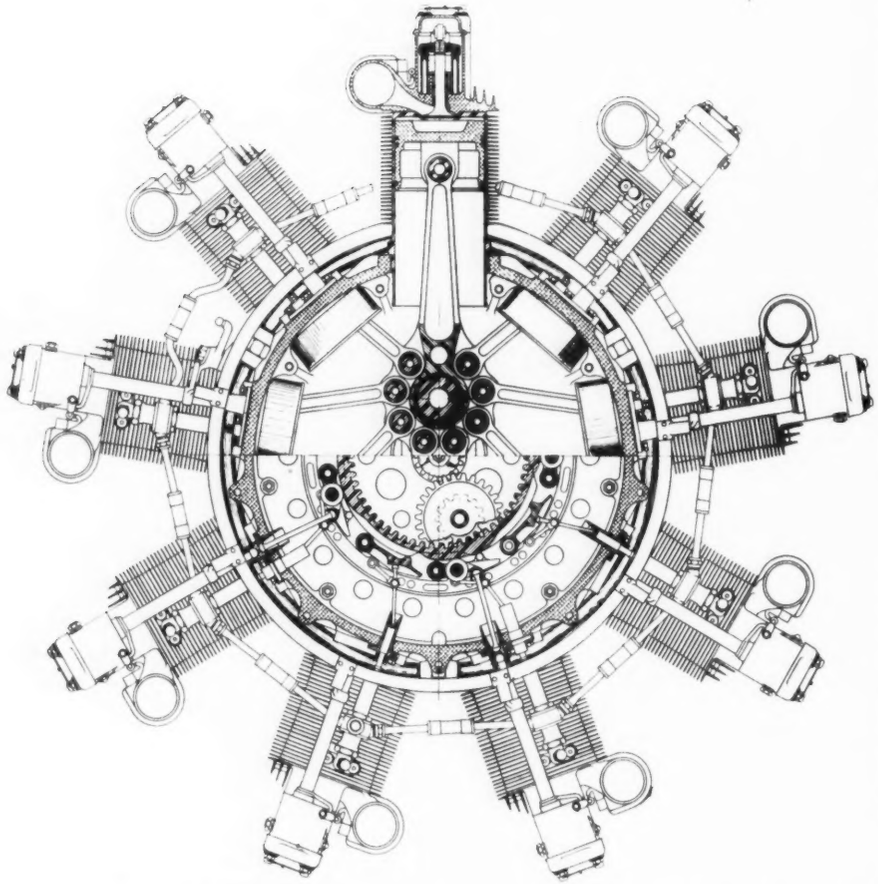
The differences between the Diesel and gasoline engines start with the fact that the gasoline engine requires a complicated electrical ignition system in order to fire the combustible mixture, whereas the Diesel engine generates its own heat to start combustion by means of highly compressed air.

This brings about the necessity for injecting the fuel in a well atomized condition at the time that combustion is desired and the quantities of fuel injected at this time control the amount of heat generated. That is to say, an infinitesimally small amount of fuel will be burned just as efficiently in the Diesel engine as a full charge of fuel whereas in the gasoline engine the mixture ratio must be kept reasonably constant and, if the supply of fuel is to be cut down for throttling purposes, the supply of air must be correspondingly reduced. It is this requirement in a gasoline engine that necessitates an accurate and sensitive fuel and air metering device known as the carburetor.

Fuel Requirements

The fact that the air supply of a Diesel engine is compressed and its temperature raised to such a high degree permits the use of liquid fuels with a very high ignition temperature and it is these fuels which correspond more nearly to the crude petroleum oil as it issues from the wells and this fact accounts for the much lower cost of the Diesel fuel, as compared with the highly refined gasoline needed for aircraft engines.

Furthermore, it is necessary that



Diagrammatic cut-away section of Packard's new airplane Diesel

gasoline have a very low initial boiling point, since the gasoline must be intimately mixed with the air in the cylinder in order to be exploded by the electric spark and this will only happen if most of the gasoline is vaporized at the time of ignition. It is this necessary quality in gasoline which brings about the grave fire hazard in connection with its use, whereas the fuel oil used with Diesel engines is purposely controlled to ignite only at relatively high temperatures, thus insuring absolute safety in handling.

The above brief considerations of the distinctions between the gasoline and Diesel engines are cited in order to enable the reader to grasp what must be accomplished in building a light Diesel aircraft engine.

High Speed Diesel Operation

In the Packard engine, moreover, a further advance has been effected over previous Diesel practice and this consists in the ability to extend the range of engine speeds possible with the Diesel cycle. Heretofore Diesel engines have been of the slow speed type running between 100 and 300 revolutions per minute in stationary and marine service. Even so-called high speed Diesels of modern type have been limited to a maximum speed of about 1200 revolutions per minute.

In the Packard Diesel aircraft engine, however, this speed has been increased to over 2000 revolutions per minute and this has been accomplished by an engine design that produces a turbulence never before approached in this type of engine. This method and the highly efficient and quick acting fuel pumps that had to be developed to go with it are the means that produce the accelerated commingling of the fuel and air which bring about this greatly increased engine speed.

This quality of successful high speed operation has been attained with a corresponding increase in maximum cylinder pressures and it was early realized that a high speed Diesel engine suitable for aircraft usage would entail these high pressures. This subject has been covered in some detail previously (See Society of Automotive Engineers' Journal for February, 1929 article on "Diesel Engines for Aircraft," by L. M. Woolson) so that further consideration at this time is unnecessary. Suffice to say that in the Packard Diesel engine the structure is capable of withstanding maximum cylinder pressures considerably in excess of 1200 pounds per square inch.

There are then to be considered in the description of the Packard Diesel engine three basic principles of design. Firstly, the engine must be sufficiently strong to withstand maximum cylinder pressures two to three times as great as those obtaining ordinarily in a gasoline aircraft engine; secondly, a high degree of turbulence must be maintained in the cylinder to permit of all the fuel combining with all the oxygen present in the cylinder during the extremely short time allotted for combustion at high engine speeds; thirdly, the fuel pumps and nozzles must be designed to operate over a much wider range of speed than heretofore found practicable in Diesel engines.

In view of the three underlying basic principles of design outlined above it would seem desirable to describe the engine from each of these three standpoints rather than merely to discuss each part of the engine without reference to its particular function in the general scheme.

Light Weight of Engine

The most interesting aspect of the engine design is undoubtedly a consideration of the design features which have brought the weight of the Packard Diesel engine down to practically the same level as that of gasoline aircraft engines of equivalent power. Heretofore Diesel engines even of the so-called light weight modern type have weighed around 25 pounds per horsepower whereas the Packard engine weighs but one-tenth as much.

This tremendous reduction in weight is, of course, essential for a successful Diesel aircraft engine and it is not surprising to find that radically new methods of construction have been employed in order to reach the desired objective. A review of the design will show that important weight economies have been secured by, first, the elimination of carburetors and magnetos, and secondly, by an intense simplification of design. Evidences of the latter are found in the one-piece crankcase construction of extremely light weight and the single valve arrangement which automatically halves the number of parts required for valve operation as found in conventional gasoline engines.

Cylinder Design

Before embarking on a detailed description of the engine it might be desirable to discuss briefly the special features of the cylinder design which have resulted in a very light construction, each cylinder weighing only 11¾ pounds. To begin with, it was recognized that the cooling problem of a Diesel cylinder was considerably simpler than that of a corresponding gasoline engine cylinder since the increased thermal efficiency of the Diesel is reflected in far lower heat losses to the cylinder walls than is the case with the gasoline engine cylinder. This fact justified a simple form of closed end cylinder design in which the cylinder head proper is formed integral with the cylinder barrel, a construction which is not considered altogether satisfactory for gasoline engines due to the inferior cooling attained with this type of

cylinder head as contrasted with the much more bulky screwed-on aluminum type of head commonly used with gasoline engines.

Single Valve for Inlet and Exhaust

Furthermore, the fact that only pure air is drawn into the cylinder on the intake stroke of the Diesel permits the novel use of a single valve for both inlet and exhaust purposes in the Packard Diesel, this contributing to a marked degree to the lightness of the cylinder itself since the cylinder head is weakened by only one port instead of two as in the conventional engine. The single valve arrangement has been favored not only on account of the general gain in simplicity and weight saving but also in the interest of reliability since the valve operates at a much lower temperature than the conventional exhaust valve due to the cooling effect of the incoming air passing over the same valve, and furthermore the available time for opening and closing the valve is lengthened appreciably so that lower rates of acceleration thereof can be utilized thus saving wear and tear on the whole mechanism. Bolted to the top of each cylinder is a light aluminum cylinder head carrying cooling fins and supporting the valve operating mechanism as well as forming the combined inlet and exhaust port.

Importance of Turbulence

It might be well at this point to consider those features of the design which have contributed to maintaining a high degree of turbulence and also the reasons therefor. It should be realized that one of the main distinctions between a Diesel engine and a gasoline engine is the manner of insuring a homogeneous mixture of fuel and air. It is obvious that in either case such a mixture must be created if perfect combustion is to be secured in the extremely short space of time available amounting to about four-thousandths of a second at an engine speed of 1800 revolutions per minute.

In the Diesel engine no fuel is admitted into the cylinder until practically the instant that combustion is desired so it is obvious that, in a high speed Diesel, special means must be provided to insure complete and efficient combustion. In the Packard engine this has been accomplished by giving the incoming air an extremely rapid whirling motion so that at high speed the circulation of the air in the cylinder is at a rate which permits of one revolution of the mass of air around the circumference of the cylinder bore during the time available for combustion.

This high velocity spiral motion of the air is brought about by shaping the inlet port as a flattened venturi arranged tangentially to the cylinder bore. The large diameter of the single valve insures not only a full volume of air to the cylinder but also offers little resistance to the speeded up air flow. Looking at the cylinder from above, the port and valve locations are such that turbulence is created in a counterclockwise direction. Here again it will be noted that the single valve arrangement lends itself particularly well to securing this high degree of turbulence since it permits of a wider venturi passage being used than would be the case with a smaller valve and this results in the ability to direct the air into the cylinder at the smallest angle to the horizontal.

In the preceding paragraph it has been shown how the air is introduced into the cylinder so that practically all of the oxygen comes in contact with some part of the fuel spray thus insuring complete combustion but needless to say such satisfactory results could not be obtained were it not for a finely atomized injection of the fuel, accurately controlled and timed.

Self-Contained Fuel Pump and Nozzle Unit

The feature which probably contributes most to this phase of operation is the combination fuel pump and nozzle unit. Heretofore the majority of solid fuel injection engines of the so-called high speed type (maximum revolutions about 1200 revolutions per minute) have been characterized by a multiple pump unit mounted somewhere on the engine remote from the cylinder heads in which the nozzles are located and connected to them by comparatively long capillary tubing. With such a system satisfactory high speed operation is very difficult to obtain for several reasons, the principal one being that enormous hydraulic pressures necessary for high speed operation cause serious surges of pressure waves in the tubing, which interfere with the correct timing of the fuel injection and also tend to make the engine run unevenly since it is difficult to arrange the tubing to the various cylinders all of the same length.

Another difficulty arises from the trapping of air in the capillary tubing which air is difficult to expel and causes the engine to misfire. All of these troubles have been overcome with the Packard fuel injection system since the pump and nozzle are practically one unit with extremely short connecting passages between them.

A great deal of care has been given to the design of the moving parts of the fuel injection system to reduce their inertia to the minimum since at high speed extremely high accelerations in the order of 15,000 feet per second are encountered.

Fuel Pumps

One of the most interesting features of the engine is the fuel pump and nozzle assembly. This constitutes a readily detachable and interchangeable unit which is bolted to a flange on the rear of the cylinder by means of two cap screws. Fuel at low pressure is supplied to the screen housing and the pump plunger is operated by an adjustable tappet. Aside from these external connections the entire pump and nozzle represents a self-contained unit.

There are many advantages favoring this construction, chief of which is the elimination of all high pressure tubing between pump and nozzle and the avoidance of troubles due to this source such as air pockets, after-dripping and variations in timing due to the compressibility of the liquid in the piping and the elasticity of the pipe itself under pressures as high as 6,000 pounds per square inch as used in solid fuel injection systems.

Lubrication Systems

In general, the lubrication system does not differ radically from conventional aircraft engine practice. A special effort has been made to simplify the system as much as possible and in the interest of reliability there are no oil pipes inside the engine nor are there any drilled passages in the crankcase itself. The system operates on the dry sump principle with an external oil tank of suitable capacity in close proximity to the engine. A pipe leads from the bottom of this tank to a connection on the oil pump housing whence it flows through a generous size screen which is readily accessible for cleaning purposes.

The oil then enters the pressure pump and from there it is forced through the main connection to the engine, with a pressure relief valve adjusted to about 60 pounds per square inch returning the excess oil to the tank. This lead to the engine is effected through a special hollow rocker arm pin opposite No. 4 cylinder. At the inboard end of this pin a groove is arranged in the diaphragm and a radial hole is drilled leading the oil to a socket connection which receives one end of what appears to be a hollow dumb-bell. The other end of this swinging connection engages a socket in a forged ring floating on the hub of the cam.

The oil is led through a groove in this ring to several holes in the cam and thence through drilled passages to the hollow extension of the rear crankshaft half. It might be mentioned in passing that the purpose of the dumb-bell connection referred to is to allow the oil ring to float concentrically on the cam without being restrained in any direction by the connecting member.

Practically instantaneous starting is possible at all times and the only difference between starting the Packard Diesel aircraft engine and the ordinary gasoline engine is that the throttle on the Diesel is held wide open while the engine is being cranked and no priming or choking is required. The engine starts immediately on its regular supply of fuel oil, no special

fuel or preparatory heating being necessary. At low temperatures it is essential to use the glow plugs and with their use it is a simple matter to start the Packard engine even after it has been standing for many hours at a temperature of zero or below.

Stopping the Engine

In stopping the engine it is merely necessary to close the throttle completely against a spring stop, this extra motion of the throttle mechanism serving to restrict the stroke of the fuel pumps until the pump plunger barely rides higher than the pump inlet port and consequently forces no fuel into the nozzle. Incidentally, the engine can be stopped instantly no matter how hot it may be since there is never any danger of the engine kicking backwards as with the gasoline engine stopped in this fashion. It is therefore never necessary to shut the fuel off when stopping nor, of course, are there any switches to operate.

Summing up, the engine is started with the throttle wide open and the engine is stopped by closing the throttle completely and there are no other controls used except those in conjunction with the inertia starter.

9 Oil Companies Exhibit at Detroit Aircraft Show This Week

DETROIT, April 5

NINE oil companies are exhibiting at the third annual All-American aircraft exposition in Detroit April 5 to 13. These companies are the Kendall Refining Co., Quaker State Oil Refining Co., Richfield Oil Corp., Shell Petroleum Corp., Sinclair Refining Co., Skelly Oil Co., Standard Oil Co. of Indiana, The Texas Co., and Vacuum Oil Co.

The Texas Co. exhibit is a mountain scene with miniature airplanes representing the refueling of the "Sun God" on its transcontinental flight. Representatives at the booth are Geo. R. Turner, W. P. Ross and H. N. Steindler.

Skelly Oil Co. has a model, one-eighth actual size, of its Spartan airplane, suspended from the roof with the propellers revolving. Representatives are W. E. Jack, A. F. Winn, Glenn Condon, R. A. Theis, and M. E. Callender. A special refrigeration unit is used in showing cold and pour tests of Skelly's airplane oils at 10 to 30 degrees below zero.

Vacuum Oil Co. has seven panels in colors showing famous flights in which its oils were used. These flights will be shown also in motion pictures at the booth. Representatives are E. J. Snow, H. W. Lake, R. L. Feezle, A. B. Bassi, A. J. Van Wagner, F. W. Sevin, and M. Muller.

Sinclair Refining Co. has a large outline map of the United States in its booth, showing air lanes, and refineries and distribution points of Sinclair's. Representatives are G. French, A. J. Doyle, Tom Wood, Douglas Wilson, V. H. Crandall, R. H. Cotter, and L. P. Lochridge.

Kendall Refining Co. has a display of photographs of various types of aircraft. Several panels list the winners of flights in which Kendall oils were used. I. H. Shearer is the representative.

Standard Oil Co. of Indiana has two aerial searchlights at its booth, and an eagle perched on top a column. Displays of Stanavo oils are at the booth. J. P. Potter is the representative.

Shell Petroleum Corp. has a display of its oils. The mystery ship, Shell's Travel Air, is at the booth also. Representatives are R. K. Clark and James Doolittle.

Quaker State Oil Refining Co. has a display of the various cuts being taken in crude oil distillation. Various products are displayed in two-ounce sample bottles. Sam Messer and W. S. Shannon are the representatives.

Richfield Oil Corp. has its booth fitted with davenports and chairs for the comfort of visitors. Fred L. Foster is the representative.

An equipment manufacturer, the Aqua Systems, Inc., has a display of gasoline storing and dispensing equipments.

Midwest Chain Has 235 Stations

CLEVELAND, March 29.—The chain of Midwest Refining Co. marketing outlets which Standard Oil Co. of Indiana, the parent company, will take over in its own name April 1, consists of 118 bulk plants and 117 service stations. The properties are in Colorado, Wyoming and Montana.

ST. LOUIS—One of the largest single trainload shipments of motor oil and grease ever made by an oil company into one state was the one of the Shell Petroleum Corp. That company recently shipped out of its Wood River refinery 18 box cars of refined products to North Carolina.

Airplane Consumption of Oil Products Doubled in 1929

WASHINGTON, April 7

AN IDEA of the growth of aviation in this country is afforded by the aeronautics branch of the Department of Commerce estimates that the consumption of gasoline and lubricants in 1929 was more than twice that of the preceding year.

The number of miles flown, according to the same authority, was multiplied by more than two. The total miles flown was 147,000,000 miles, gasoline consumption 20,576,468 gallons and lubricants 1,028,823 gallons.

These figures are parts of an estimate covering four years, 1926-1929. In that period the estimated gasoline consumption was 30,811,954 gallons, and lubricating oil 1,941,098 gallons. In other words the estimate is that in the last year gasoline consumption was two-thirds of the total for the four year period. That is also true of the estimate of lubricating oil.

Much of the gasoline and oil consumed was used by airplanes designated as miscellaneous aircraft operation—student instruction, aerial photography, sight-seeing, non-scheduled commercial operation, crop dusting, and experimental flying. Such operations are estimated to have accounted for 16,176,468 gallons of gasoline.

Scheduled air-transport operations of mail, passenger and express planes used 4,400,000 gallons of fuel and 220,000 gallons of lubricating oil.

Estimated Gasoline and Oil Consumption by Commercial Aircraft for the Calendar Years 1926, 1927, 1928 and 1929

	1926	1927	1928	1929
AIR TRANSPORT				
Airplane-miles flown	4,318,087	5,870,489	10,673,450	[1]22,000,000
Gasoline consumption, gallons	[1]863,617	[1]1,174,098	[2]2,134,690	[2]4,400,000
Oil consumption, gallons	[1]43,181	[1]58,705	[1]106,735	[2]220,000
MISCELLANEOUS				
Airplane-miles flown	[1]18,746,640	[1]30,000,000	[1]60,000,000	[1]125,000,000
Gasoline consumption, gallons	[2]2,426,028	[2]3,882,351	[2]7,764,702	[2]16,176,468
Oil consumption, gallons	[2]121,301	[2]194,118	[2]388,235	[2]808,823
ALL OPERATIONS				
Airplane-miles flown	[1]23,064,727	[1]35,870,489	[1]70,673,450	[1]147,000,000
Gasoline consumption, gallons	[1]3,289,645	[1]5,056,449	[1]9,899,392	[1]20,576,468
Oil consumption, gallons	[1]164,482	[1]252,823	[1]494,970	[1]1,028,823

[1]Estimate based on reports.
[2]Estimate.

Problems in Air and Gas Injection Studied in Harmel Field

Staff Special
MIDLAND, Texas, April 9

CONCLUSIONS reached with respect to the use of air, wet gas and dry gas for repressuring oil sands are summarized in a paper prepared for the Midland meeting of the American Petroleum Institute division of production, southwestern district, by E. V. Foran, engineer for the Fain-McGaha Oil Corp., Wichita Falls.

Based on a study of decline curves and results observed for a period of four years on Harmel field leases, in Archer county, Texas, he found:

(1)—That air may be used for repressuring purposes as a substitute for gas without disadvantages only when there is no water produced with the oil.

(2)—The gravity of the oil during repressuring operations will not be reduced while the natural wet gas is recirculated.

(3)—That dry gas has a tendency to channel more readily than either air or wet gas.

Mr. Foran has found that in cases where operating pressures are high the distribution of gas and air in sands is best controlled by the direct application of back pressures.

In the case of the larger wells which will permit, he finds it better to adjust the length and frequency of the stroke to the point which exploits only a part of the well's potential production, resulting in a high constant fluid level being maintained on the sand.

The pumps in both cases, according to Mr. Foran, should be placed as near the bottom of the well as pumping conditions permit, in order that the face of the sand may be kept free of water.

Due to the expansion of repressuring operations, he has found it becoming increasingly difficult to choose compressor equipment suitable to the specific conditions of recent practice.

"There seems," he says, "to be considerable difficulty in acquiring high pressure equipment suitable for small scale field testing. Due to many unforeseen factors in the course of experimental repressuring it would be of great value to the operators to be able to obtain small equipment of convertible nature.

"That is to say there is a need for compressors whose cylinders or bearings may be interchangeable, or replaceable, in order to withstand higher pressures than those for which the present standard small equipment is designed."

Variable reactions to repressuring work have been indicated in observations made, according to Mr. Foran, depending on conditions under which air or gas was applied. Surveys of wells are recommended, as early in the life of the lease or pool as possible, or at any time while the reservoir pressure is still very active in driving oil into the well.

Under such conditions, he has found the gas/oil ratio of the different wells serves as an indicator of the relative oil and gas saturation of sands surrounding the wells. High gas/oil ratios under such conditions will indicate medium or low saturation while low gas/oil ratios will indicate in general high saturation.

An account is given by Mr. Foran of four years repressuring operations in the Harmel pool, where air, wet gas and dry gas have all been applied. Development work on the four leases started in September, 1924, and the drilling was completed in June, 1925. No completions have been made since that time. The producing sand is found at depth of 1280-1350 feet and varies in thickness from six to 20 feet. While the sand is loose in most wells, some of them indicated extremely tight sand conditions.

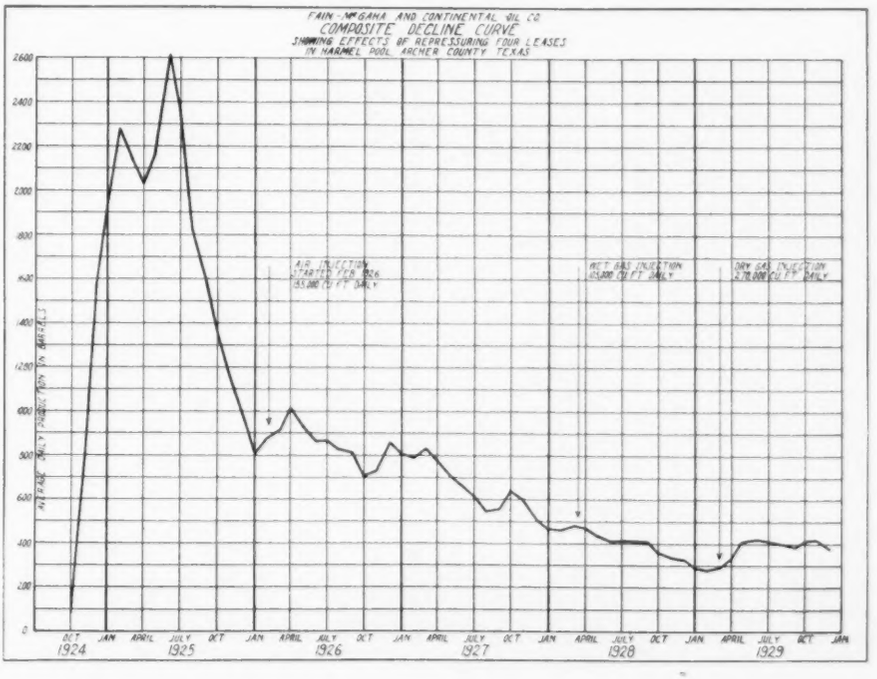
Upon completion of both tight and loose sand wells only a small volume of gas was observed, although many of them were good oil producers. A total of 68 wells were drilled on the four leases, but 15 of them were abandoned the first two years because of low yields.

Referring to an attached chart, showing a composite production decline curve of the four leases, Mr. Foran points out that it is apparent the decline from the production peak was very rapid, although water played no part in it. The decline is described as probably due to the small volume of gas and a low initial reservoir pressure.

In view of these circumstances, the operators decided on a repressuring program and began injecting air into the sand in February, 1926, seven months after the peak of production.

Although the decline rate at this time was very rapid, the reaction was sharp and a progressive increase in production was observed during the following 90 days. By August, 1926, all four of the leases were being repressured and gave very good results.

During the fourteen months following the injection of air, the production was maintained with a very low decline rate. The volume of air injected into the sand during this period was



approximately 155,000 cubic feet per day.

There were five input wells and the pressure required to force the gas into the sand varied from 10 to 45 pounds per square inch. During the latter part of 1926 and early in 1927 a progressive increase in water was noticeable, but did not seem to affect the production, although corrosion of well equipment became evident.

By August 1927 corrosion became so severe and threatening that it did not seem advisable to continue with the air in spite of the good results. The output gas of each of the 41 producing wells was analyzed and air was present in all. The air content of the gas produced from individual wells varied from 7 per cent to as high as 95 per cent. The air content of the gas by leases varied from 46 per cent to 77 per cent. The air and salt water caused excessive corrosion of rods, tubing and casing as well as the working parts of the pump. The volume of air injected into the sand at this time was 165,000 cubic feet daily, but this amount was reduced to 130,000 soon afterwards.

Following the survey of conditions it was decided to recirculate the air-gas mixture of the lease showing the 77 per cent air instead of continuing the injection of free air, to determine if it were not possible to filter out most of the air. This would be accomplished by returning a total of only 70 per cent of the output mixture to the sand. This process would result in a constant depletion of the volume of air in the sand and in circulation because no additional free air would be injected into the system, yet 30 per cent of the daily air content of the output gas would not be returned.

All of the air-gas mixture produced from the other leases during the previous period of repressuring went to a casinghead gasoline plant after being diluted with wet gas from other leases in the pool.

Recirculation of the air-gas mixture on the first lease was started Nov. 10, 1927. At this time the air content of the output gas from this lease averaged 77 per cent. During the following five months the air content was progressively reduced and production was maintained.

The change in the air content of the output gas varied as follows: November 77 per cent, December 62 per cent, January 56 per cent, February 51 per cent, March 46 per cent, April 41 per cent. This trend of reduction in the air content also reduced corrosion troubles. The recirculation of the wet air-gas mixture which carried 3.5 gallons of gasoline per 1000 cubic feet also increased the gravity of the oil 1 degree A.P.I. During the period from November, 1927 to April, 1928, the injection of free air continued on the other three leases.

As a result of the observed reaction to the recirculation of the air-gas mixture it was decided to do likewise with the other three leases in an effort to ultimately use the natural casinghead gas for recirculation as no other source of gas was available. In April, 1928 recirculation of the air-gas mixtures was started on all leases, the first reaction to this change being a rise in the gravity of oil on all of the leases but a decline in production.

The decline was due to an insufficient volume of air-gas mixture to supply both lease fuel and repressuring requirements. The total volume of the wet air-gas mixture available for return to the sand at this time was 105,000 cubic feet. The object in using the air-gas mixture was not to increase production as much as it was to eliminate the corrosion due to the use of free air.

As the available volume of wet gas decreased during the following months, production continued to decline but corrosion disappeared when the air content was reduced below 15 per cent. During the winter of 1928-1929 the volume of wet gas available for return to the sand became insufficient to give desired results. There was a progressive rise in the gravity of the oil from April 1928 to November 1928. The gain on different leases varied from 0.7 degrees to 1.2 degrees A.P.I.

In March 1929 a supply of 0.60 gravity dry gas became available in the district and it was decided to use dry gas exclusively for repressuring and deliver the wet gas to a casinghead gasoline plant for treatment. Late in March, 1929, the injection of air-gas mixtures was discontinued and dry gas was turned into the same input wells.

The volume of dry gas required by the sand was greatly in excess of the wet gas required for favorable results under approximately the same conditions. Large volumes of dry gas were required to increase production and it was several months before the daily gross output of gas even equalled the daily input volume whereas during the previous three years, using air and wet gas, the output gas volume always exceeded the input gas by 30 per cent.

The reason for the failure of the output gas volume to exceed the input volume during the period of dry gas injection, is not known but may possibly be due to its ability to migrate more readily to tighter areas in the sand than that occupied by the wet gas and air. This might be explained due to the viscosity of 0.60 specific gravity gas being much less than that of air or 1.08 specific gravity wet gas.

It was clearly noticeable that the dry gas had a tendency to "channel" or bypass the oil much more readily than the air or wet gas. The air and wet gas did not show any tendency to bypass the oil during the entire period of the three years during which they were applied whereas the dry gas has given considerable trouble in this respect throughout its period of application. However, this may be due in part to the increased volumes of dry gas used.

It is also noticeable that the dry gas has resulted in a marked decrease in the gravity of the oil. Had a sufficient volume of wet gas been available for use in repressuring, it is probable that excellent results would have been realized, as even at the low pressure in which it was used (10 to 45 pounds per square inch) a portion of it was readily soluble in the oil due to its high gasoline content of 3.5 gallons per 1000 cubic feet. Under these low pressures very little dry gas or air can be absorbed by the oil.

Production Division Meets May 23-24 at Tulsa

TULSA, April 5.—The spring meeting of the Mid-Continent section of the American Petroleum Institute, Division of Production, will be held May 23-24, at the Mayo hotel, Tulsa. Officers for 1930 will be elected.

Five papers on drilling and producing subjects are being prepared. The papers are "Weighing Wells"; "Mud Fluids"; "Some Recent Developments in Deep Well Pumping Methods"; "Oil Treating Methods"; and "Good Practice on Lease and Well Connections."

Those contributing to the papers are E. A. Carr, Pure Oil Co.; R. M. Carr, Sinclair Oil & Gas Co.; H. D. Collins, Gypsy Oil Co.; F. B. Hall, Tidal Oil Co.; R. R. Hawkins, The Texas Co.; F. W. Robson, Carter Oil Co.; C. V. Sidwell, Amerada Petroleum Corp.; H. F. Beardmore, I.T.I.O.; R. W. Bond, Shell Petroleum Corp.; R. S. Cartwright, Prunty Drilling Co.; Arch Haynes, Haynes Drilling Co.

T. H. Rakestraw, Gypsy Oil Co.; C. C. Carlyle, Prairie Oil & Gas Co.; E. H. Griswold, Continental Oil Co.; E. F. Guidinger, Phillips Petroleum Co.

L. S. Thompson, Carter Oil Co.; D. L. Trax, Gypsy Oil Co.; P. L. Guarin, Shell Petroleum Corp.; R. R. MacDonald, Shaffer Oil & Refining Co.; J. R. McWilliams, Skelly Oil Co.

C. V. Millikan, Amerada Petroleum Corp.; L. A. Ogden, Empire Oil & Refining Co.; Charles Prather, Gypsy Oil Co.; R. W. Spencer, Barnsdall Oil Co.; C. M. Copeland, Comar Oil Co.; K. A. Covell, I.T.I.O.; R. E. Kollar, Carter Oil Co.; F. W. Shelton, consulting engineer; L. A. Summers, Barnsdall Oil Co.

The program committee consists of W. K. Whiteford, Barnsdall Oil Co.; R. W. Bond, Shell Petroleum Corp.; E. H. Griswold, Continental Oil Co.; R. R. Hawkins, The Texas Co.; and R. M. Carr, Sinclair Oil & Gas Co.

Farmers' Union Promotes Royalty Pools Among Members in Mid-Continent

OKLAHOMA CITY, April 5

THE activities of the Farmers Union of Oklahoma in the oil business are not confined to its entry into the business of selling gasoline, described in a previous article in these columns. It is shaping itself to exercise a definite influence in the production of oil in areas as yet little explored.

Not many oil men outside of Oklahoma City realize that the Union is pushing vigorously its plan of pooling mineral rights under acreage in Oklahoma. (In Kansas, New Mexico and Texas the same plan is being followed under slightly different set-up, although not, of course, under the Farmers Union of Oklahoma whose activities cease at the state boundaries.)

There are two pools—this word being used to designate the company—functioning in Oklahoma. One is the Farmers' Union Cooperative Royalty Co. The other is the Panhandle Cooperative Royalty Co. The former has as its president John A. Simpson, president of the Farmers' Union of Oklahoma. Other officers are Campbell Russell, one time member of the state corporation commission, well known to the oil industry of the state through his several attempts to increase oil and gas production taxes. He is vice-president. Z. H. Lawter, secretary of the Union, is secretary of this royalty company. T. A. Witten and W. D. Housh are directors.

The president of the Panhandle Cooperative is W. M. Darnell, one time candidate for governor of Oklahoma. He is credited with having done much of the organization and pioneer work of getting the pools started. J. C. Sprowls, farmer, is vice-president; J. G. Queenan, royalty operator, is secretary; G. F. Patterson, treasurer. Lee Stinchcomb and H. O. Miller are directors.

These are the two that are sponsored directly by the Farmers' Union of Oklahoma. The influence of these pools is growing. Persons associated with them predict that the time will come when auction sales of oil and gas leases on pooled lands will be conducted, in the manner of the governmental auction sales of Osage oil leases. Indeed, they say that the whole idea is based upon the Osage method, where tribal lands, although allotted as to surface, are undivided as to mineral rights, members sharing in the revenues on a per capita basis.

Besides the Union-sponsored royalty pools, there is a second important factor. That is the Flag Oil Corp. which performs all services incidental to getting the acreage into the pools, makes geological examinations, assists the farmer in leasing his land and keeps the books. It acts in the capacity of manager of the whole arrangement.

The set-up of the two pools mentioned is as follows, using the Farmers' Union Cooperative Royalty Co. as an example: There are 3000 headrights in the pool. One headright is issued for each 40 royalty acres, undivided, put into the pool. Thus, a farmer having 80 acres, would be permitted to assign no more than half interest, undivided, to the pool, which would give him one headright. Of this 40 acres, the Flag Oil Corp. would in turn be assigned 10 royalty acres, or a quarter interest. That same interest to the Flag runs throughout.

For each royalty acre turned to it, the Flag issues 2½ shares of its authorized 1,250,000 shares of no par value stock, or 25 shares for each 10 acres it receives from every 40 royalty acres turned into the pool. The Flag realizes its income with which to pay expenses of performing the various services for the pool by selling the stock. There are some large stockholders, it is said.

The Flag Oil Corp. is headed by A. E. King, cotton oil man and banker, of Oklahoma City. Ira L. Rupley, merchant, of San Antonio, is vice-president and Aldrich Blake, of Oklahoma City, is secretary. He has been identified with Oklahoma politics in past years and has been in the oil royalty business.

The treasurer of the Flag is Emanuel Schonwald, geologist. Irving Perrine, geologist; R. K. Wooten, cotton oil man; W. M. Darnell, previously named as an official of the Panhandle pool; C. E. Huff, national president of the Farmers' Union; T. P. Gore, former United States senator and John A. Simpson are directors of the Flag. Mr. Perrine handles the geological examinations.

Naturally, the farmers do not come running eagerly to put their acreage into one or the other of the pools. Now and then they do, having heard the arguments in favor of such pooling from the Union or from the local, but in general they must be solicited, just as they are for leasing or royalty buying by an oil or royalty company.

The Flag Oil Corp. employs agents, giving them instructions as to the country to be worked and in some instances, on advice of the geologists, narrowing the agent's efforts for the time being to a single township where structural conditions are believed to be good. The manner in which this work is handled is indicated by the following excerpts from a bulletin of instructions to agents:

"Wherever geological structures are known, we will endeavor to direct agents to secure several tracts upon them. Where structures are not known, we desire to 'play the checkerboard,' accepting only one or possibly two well-placed tracts in any one township. . . . The fact that we will not accept large numbers of headrights in any one community is what makes our pool so desirable. It guarantees our great spread over a wide territory.

"The headrights in the Farmers' Union pool are for Farmers' Union members only. . . . Membership as of the date of application is sufficient (A membership costs $2.) If a member should lapse in payment of dues at some future date, this would not invalidate his headright.

"There exists in the state a number of definitely known granite formations and mountainous districts. Except where specific instructions to the contrary are given agents should not accept any acreage for any pool with-

Texas Governor Curbs Pipe Line Law Funds

HOUSTON, April 3.—The 18 deputy supervisors of the oil and gas division, Railroad Commission of Texas, should be able to make all investigations necessary in administration of the new pipe line control bill when it becomes effective in June, according to Governor Dan M. Moody.

The governor has indicated he will not approve a proposed appropriation designed to enforce provisions of the statute which he recently allowed to become a law without signature. The law was calculated to extend state control over oil pipe lines and to make them public utilities within prescribed limits.

In the general departmental appropriation bill, the railroad commission is given three contingent funds, as follows: gas utilities division, $5300 for each year of the biennium; oil and gas division, $32,500,000; main office, $15,000.

in five miles of granite. . . . The inclusion of such 'dead' acreage in our pool would be distinctly unfair to those members who pool accessible acreage on the promise that every other tract possesses a possibility of future oil development.

"Under our mineral deed a mortgage foreclosure takes priority over our mineral right. Hence it is very important that this office be given exact information as to the amount and extent of any loans on land. Quite often the existence of a reasonable mortgage makes the land more acceptable to us as it is an additional assurance of good title. . . . If the land is heavily mortgaged and is not in particularly desirable territory, this company would prefer to reject it rather than be forced to assume the mortgage to save its mineral rights.

"If the land is foreclosed, it means that the men who are assembling the pool would have to go elsewhere and buy acceptable acreage to substitute for this lost tract. Our contract requires that every headright be represented in the pool by 40 full acres of royalty.

"Avoid professional brokers," is an admonition to agents. "We make it a practice to reject all royalty submitted for headrights by commercial royalty brokers or by individuals who have purchased them from such sources, unless this company is satisfied, from examination of the abstract to date, that the title is sound in every way. Much of the royalty on the open market has serious flaws in it."

The letter of instructions above quoted also sets forth the variations from the theoretical standard of taking 40 full royalty acres under an 80, or an even half, undivided, all the way through.

"The basis for exchange of a headright in this royalty pool is a one-half interest undivided under 80 acres. This gives the pool full 40 acres of royalty undivided under 80 and makes the actual spread from which later revenues are possible double the amount of actual acreage pooled. In land where possibilities are less pronounced, we often suggest that the pooling of 40 acres undivided under 160 acres might be the deciding feature in making the tract acceptable as it gives a wider spread. . . .

"Occasionally we are asked to issue a share of stock (headright) for all of the royalty under a 40. This is undesirable from the standpoint of the landowner and from the standpoint of this company. If oil is found on that tract the landowner would never receive anything other than his equal share with every other headright owner in the oil from his land. If he pools only a half interest, undivided, then he assures himself of large income if oil is found on his land and insures himself against total loss if his particular tract is found to be unproductive."

As mentioned before, there are five of the pools operating. In Texas, where the Farmers' Union is not strong, the Texas-Osage Cooperative Royalty Pool is organized under the corporation laws of the state; the New Mexico-Osage Cooperative Royalty Co. is similarly constituted, but the one in Kansas, the Kansas Farmers' Union Royalty Co. is sponsored by the Union.

In these five pools have been placed 523,164 full royalty acres. The percentage of this under lease to oil companies probably is about 30. Naturally, the ambition of the pools is to get as much leased as possible so that the rental, averaging one dollar per acre a year, will be coming in. All rental monies are deposited with designated national banks and cannot be withdrawn except for purposes of paying dividends and then only upon majority vote of the stockholders, not of the Flag company, but the Union pools. Each headright owner has one vote no matter how many headrights, or shares he holds.

Two of the pools have paid dividends. The Texas one paid $10 in less than two months after it started. The money was realized from the sale of one lease. There were only a few headright owners in so the total payment was not large. It made good advertising, however. The same was true of the two dividends paid by the Panhandle pool, a $1 dividend being paid in January, 1929, and another of $2 in June.

Three signatures are necessary to any lease on tract which is included in the pool. These are the landowners, the pool and the Flag company. Much of the leasing is handled directly by the landowner and the pool merely acquiesces as does the Flag, unless it possesses geological information or knowledge of the beginning of a "play" that the farmer doesn't know about. In that case it will advise him to try for a better offer.

In cases where the landowner has already sold part of his royalty he can still put his acreage into the pool provided he is able to deliver a full half, undivided, under his land.

There is no way in which either the pool or the Flag can sell the royalty that has been assigned to it.

Co-ordination for A.P.I. Division Provided

HOUSTON, April 3.—Creation of a central co-ordinating committee to oversee activities of district sections of the American Petroleum Institute division of production is announced from Dallas headquarters over the signature of William N. Davis, Bartlesville, the general chairman of the division.

The chairman of the central committee on district activities will be T. E. Swigart of the Shell Oil Co. (California), Los Angeles; vice chairman, J. R. McWilliams, Skelly Oil Co., Tulsa; secretary, Carl A. Young, American Petroleum Institute, Dallas.

Listed as exofficio are the chairmen of the five district sections, at present as follows:

Eastern district—E. L. Estabrook, Pan American Petroleum & Transport Co., New York City.

Mid-Continent district—J. R. McWilliams, Skelly Oil Co., Tulsa.

Rocky Mountain district—R. S. Shannon, Continental Oil Co., Denver.

California district—A. H. Bell, Continental Oil Co., Los Angeles.

Southwestern district—Walter H. Meier, Atlantic Oil Producing Co., Dallas.

Standardization Committee Changes Made by A.P.I.

NEW YORK, April 5.—Changes in personnel of the rig and derrick standardization committee of the American Petroleum Institute have been announced by W. W. Fondren, Humble Oil & Refining Co., Houston, national chairman of the committee.

Those changes include the appointment of W. H. Meier, Atlantic Oil Producing Co., Dallas, as national secretary and chairman of the engineering sub-committee, succeeding R. G. Hamaker, Reed Roller Bit Co., Houston, resigned.

P. L. Blodgett, Richfield Oil Co. of California, Los Angeles, has been appointed chairman of the California district sub-committee, replacing the late J. J. Hern.

K. N. Saatjian, The Texas Co., Los Angeles, and Samuel McIntyre, Chanslor-Canfield Midway Oil Co., Torrance, Cal., are new members of the California district sub-committee.

H. M. Harris, Humble Oil & Refining Co., is a new member of the engineering sub-committee. E. R. Ames, Texas Creosoting Co., Orange, Tex., and A. C. Horner, National Lumber Manufacturers Association, San Francisco, have been made members of the sub-committee on lumber specifications.

The Louisiana and Arkansas district sub-committee has been merged with the Texas district sub-committee under chairmanship of J. H. Tucker, Gulf Production Co., Houston.

Wildcats of Texas Panhandle and Kansas May Indicate New Oil Pools

By William F. Lowe
N. P. N. STAFF WRITER

TULSA, April 5

THE most important wildcats of the Mid-Continent during the past week have been in the Texas Panhandle. Both Moore and Collingsworth counties have wells that figure large in the news and may portend greater things in their respective areas.

In Oklahoma, the wild well of the Oklahoma City pool continues to be the center of interest, though other wells in the same pool merit attention.

A wildcat that seems to be promising better things for Edwards county and Siliceous lime production for the Voshell pool of McPherson county were the most important developments in Kansas.

Moore county, in the Panhandle of Texas, has been looked on as a sort of dark horse for some time. Though it has only one producing well outside of the Armstrong-Byrd pool, which is on the southeast line of the county, this well has a potential that has some indication of a pool in the neighborhood. Known as the Morton et al., it is located in 191-Block 3T-T&NO Survey. At a total depth of 3486 it was gauged at 300 barrels of high gravity oil. There is no pipeline nearer than the east county line and the well has been standing with no outlet since it was completed in the spring of 1927.

Moore County Wildcat Sprays Oil

Two miles northeast of the Morton well, the Operators Oil Co. has been drilling a well in the SE SW of 164 Block 3T-T&NO Survey. The well gauged 46,000,000 cubic feet of gas at 3065 some weeks ago and this week, at a total depth of 3300 feet began spraying oil. It has many of the characteristics of the old Morton well and the conjectured pool in that particular area seems about to materialize. If it is as good or better than the well in Sec. 191 it is quite probable that a pipeline will be built into Moore county and a drilling campaign will be the result.

That the Panhandle is more active now than it has been for some weeks is evidenced by the increase in the daily average production. This reached 91,000 barrels during the past seven days. Most of the increase is due to the extension of several pools both in Huchinson and Gray counties though the latter is primarily responsible as usual. The Finley and Wilcox-Combs pools of Gray county are the most active.

Collingsworth county, also in the Panhandle, made its first hit this week when the Shoupe Bros., No. 1 Aldous, 96-Block 16-H&GN Survey, started out as a 10-barrel producer. The well is located four miles south of the town of Shamrock. First gas was encountered at 1442, an increase at 1678 with first oil at 2176. The pay was from 2194 to 2198 from which the well was producing 10 barrels of oil and one half million gas per day. It is also making one half bailer of water per hour. Though the well is not so big that proration will be necessary, it is an encouraging indication and proves that all the hard things said about the county are not necessarily true.

Wild Well Forces Curtailment At Oklahoma City

Curtailment of activity in the Oklahoma City pool, due to the as yet uncontrolled effusions of the wild Mary Sudik well, is still in vogue. Every possible effort is being made by the owners, the Indian Territory Illuminating Oil Co., to bring this well under control. The problem is a serious one, both for this company and the others in the south end of the field, for all operations within two miles of the well are, of necessity, shut down most of the time.

One half mile due west of the wild well in the NE SE, 36-11-3W, the No. 1 School Land of the Sinclair Oil & Gas Co., kept going when the wind was right and was completed as a 10,000-barrel producer before the general shut down order was issued by the fire marshal. It is a sand well. The most interesting thing about it is the fact that this particular sand happens to be the Wilcox. It was topped at 6603 and penetrated 30 feet.

As far as is now known, only two other wells in the pool are definitely in the Wilcox, and one of these is thought to be the wild Mary Sudik. Geologists have been rearranging some of their ideas on the sand producing horizon of the Oklahoma City field and many of the wells formerly thought to be obtaining their oil from the detrital zone are now considered to be in the Simpson. Identification of the Wilcox sand of lower Simpson, however, has not often been made.

In the north end of the Oklahoma City Pool the town lot drilling campaign assumes proportions that would be amusing if it were not so serious. There seems to be no end to the way this pool is spreading out near the city limits and trouble will be in the offing when the present crop of new locations becomes wells. There were 10 completions this week with only four of these being below 10,000 barrels initially.

The pool has returned to its former proration schedule of 16 2/3 per cent of the potential production, which is an increase of 12½ per cent over the allowable limit of the past month. On April 5 the production reached a new peak when it went to 140,909 barrels per day. Of this amount 30,000 barrels represents oil that was picked up from the pits around the wild well, though the remainder is the production of but 33 wells. The total number of producing wells is 167.

The most interesting individual well of the week in Kansas was the Dixie-Amerada wildcat in the SW SW SW, 22-25-17W, of Edwards county. The well found 15,000,000 cubic feet of gas in a lime from 4450 to 4462. It is logging nearly 70 feet higher than the well of the British-American Oil Prod Co., three and one half miles southeast. The latter well is a potential 50 or 60-barrel producer with 11,000,000 gas at a total depth of 4572. With the showing of these two wells, it is reasonable to believe that the area has very definite possibilities.

Voshell Production Double Pipe Line Outlet

Siliceous lime production, which was discovered last week in the Voshell pool of McPherson county, Kansas, has boosted the daily average potential for the area to 30,000 barrels. This figure is double the pipe line capacity and proration will become a fact there in the very near future. A schedule has been in force for some time past but the production dropped below the allowed figure.

To date there has been only one failure in the Siliceous. This was the

Prairie Oil & Gas Co., No. 3 Stucky, NE NW SW, 10-21-3W, which had a hole full of water from 3508 to 3511. Several other wells have been successful in the lower pay, however, and the Voshell pool assumes a new importance.

A possible new producing area in this same county seems to have been discovered six miles north of the Ritz pool. The Mid-Kansas Oil & Gas Co., No. 1 Pitts, C SW SE 9-19-2W, had a show of oil at 2960, with 3,000,000 gas from 2937 to 2943, and swabbed 120 barrels of oil in nine hours from a chat pay at a total depth of 2972.

That this well may be the start of the fourth oil pool in the county is a possibility but until further data can be obtained on the tricky pay it is considered just one of those things.

Price Increase Rumor Swells As Crude Leaves Storage

TULSA, April 5

IT'S been a common saying among oil men during the past several years of over-production that when nothing is happening things are getting better. Judging from that sign, conditions must be very much better this past week, for very little occurred.

The two chief topics of conversation were the wild well in the Oklahoma City pool and the possibility of a price advance. On the latter score there is plenty of conversation. The date has been set several times for the blessed event, but each time there has been a miscalculation. However, the optimists assert that the increase will certainly be posted before long. They point to the tremendous consumption of gasoline during the first quarter of 1930 and the effectiveness of proration which has resulted, in Oklahoma and Kansas, in a liberal withdrawal of oil from storage. Currently, say some of the folks who regularly convass the storage situation, the withdrawal is at the rate of 75,000 barrels or more per day.

Proration in Oklahoma is having pretty nearly the desired effect. For the current week the daily average was about 635,000 barrels daily. This is 35,000 barrels higher than the figure fixed in the corporation commission's order governing the second quarter.

A movement is under way to tighten up the bearings of the proration machine by hitting at new discoveries. The corporation commission inquired of the umpire what could be done to hold back new fields a little more effectively than had been the case in the past.

Mr. Collins has suggested to the proration committee of the Mid-Continent Oil & Gas Association, Kansas-Oklahoma division, that a commission order forbidding pipe lines from running more than 50 barrels per day from wildcat wells that open pools might do the trick. The committee has this under consideration now.

Thus the state of Oklahoma seems to be stepping out on its own in the matter of conservation. The corporation commission went along since 1927, ratifying the wishes of the operators by issuing appropriate orders based upon certain powers given to the commission under the oil and gas conservation laws of Oklahoma. It held hearings only upon the petition of the operators. Now, it appears, the commissioners have become quite conscious of the state's share in the oil business and the desirability of keeping production in line with demand.

Part of the general news of the week concerns the preparations being made by the Independent Petroleum Association of America for its Fort Worth convention, April 18 and 19. The first day will be devoted to executive sessions between the officers and directors and the second day will be open to all. Special trains are being arranged for to run from Tulsa and from Oklahoma City. Association executives estimate in advance the attendance at not less than 1000. While much of the program will be devoted to the tariff question, other matters of concern to the industry will be brought up.

Principal items of new construction currently involve the Sinclair Pipe Line Co., which will double its present capacity from the Oklahoma City field by constructing a 10-inch line paralleling its 37-mile line which connects with its main trunk line near Shawnee and the expansion of the Texas-Empire Pipe Line Co. capacity from the Mid-Continent to Chicago through construction of additional pump stations.

At highest operating pressure the Empire line will be able, when new construction is completed, to deliver 70,000 barrels daily. It serves the plant of The Texas Co., at Lockport, Ill.; the new refinery of the Empire, at East Chicago delivers oil to the Indian Refining Co., at Lawrenceville, Ill. and handles tender shipments made by the Tidal Oil Co. to the Tidewater eastward going line at Stoy, Ill.

Pipe Protection Institute Formed

NEW YORK, April 5.—The Underground Pipe Protection Institute has been formed as an association of manufacturers of materials for protecting underground pipe against corrosion. Its organization was effected at the recent conference in Tulsa March 17 in which the corrosion studies on underground pipe being carried on under several auspices were discussed.

E. M. Converse, Dearborn Chemical Co., Chicago, is president of the new association. E. S. Browning, of Hill, Hubbell & Co. division, General Paint Corp., Chicago, is vice president. W. H. T. Thornhill, Wailes Dove-Hermiston Corp., New York, is secretary-treasurer.

These officers, together with E. V. Rinehardt, Johns-Manville Corp., New York, and William H. Kershaw, The Texas Co., constitute the board of directors.

The objects of the organization, as expressed in the constitution, are as follows:

"To create a medium through which the members may establish authoritative relations with organizations studying the subject and the economics of the protection of underground pipe against corrosion, i. e., Bureau of Standards, American Petroleum Institute, American Gas Association, American Water Works Association, and similar technical organizations.

"To promote a better understanding of the problems surrounding the subject and the economics of the protection of underground pipe against corrosion.

"The advancement of the interests of its members and the establishment of friendly relations with the members of technical societies interested in the subject and the economics of the underground protection of pipe.

"To establish and encourage ethical practices within the industry."

Companies represented at the organization meeting were as follows: Hill, Hubbell & Co., General Paint Corp.; E. I. Du Pont de Nemours & Co., Inc.; McEverlast, Inc.; The Barrett Co.; Sherwin-Williams Co.; Johns-Manville Corp.; Dearborn Chemical Co.; The Arco Co.; Wailes Dove-Hermiston Corp.; The Phillip Carey Co.; The Texas Co.

LANSING, Mich., April 5.—Oil and gas leases on state property will be auctioned at Lansing April 28. Proven and wildcat acreage is in Midland, Clare, Kalkaska, Lake, Newaygo and Mason counties.

ADVERTISING PAGES REMOVED

WHENEVER there is a task to be done that taxes the ingenuity of man the volunteer advisers fairly boil out of the sideroads and the underbrush. They appear as suddenly as though a magician had waved his wand and commanded their attendance. Everyone whose car has broken down on a busy street knows how much free help is to be had without asking for it.

The same applies to the oil country. When the Indian Territory Illuminating Oil Co.'s Sudik well in the Oklahoma City pool went wild last week and made an estimated 200 million feet of gas per day and between 2000 and 3000 barrels of oil hourly suggestions on what to do about it were by no means confined to those made by the company's engineers and production men. There were telephone calls, letters and telegrams. As the news got about over the country the number of telegrams increased. Some forwarded their ideas; others named their fee for doing the work.

Big oil or gas wells that catch on fire bring out more suggestions than does a well that is merely out of control. The Standard Oil Co. of New Jersey's Roumanian subsidiary owns a well that caught fire upward of a year ago and is still going. The government authorities took charge of it, which is probably one reason that the fire was not put out long ago.

Superintendent Daly, of the Jersey's subsidiary, received thousands of letters from people who had some wild-hair idea or other. Most of them wanted money. One man said that he had a plan which involved the use of vinegar. Another was certain that for a suitable reward he could extinguish the flame by prayer.

* * *

Hal W. Stewart, for the past two years general counsel of the western division of the Ohio Oil Co., has been transferred from Casper to the home office at Findlay, O., where he will be assistant to General Counsel Merle M. P. Poe. Mr. Stewart joined the Ohio organization in Montana about the time of the early Sunburst field development. He moved to Casper to assist A. M. Gee, succeeding the latter as general counsel of the division when Mr. Gee came to Tulsa as general counsel for the Mid-Kansas Oil & Gas Co., subsidiary of the Ohio.

* * *

It is reported by a coadjutor that there is a pipe-liner's boarding house in Oklahoma where fully 50 men sit down to eat and that nobody starts until all are in place. Pipe-lining, like everything else, seems to be succumbing to the softening influence of Emily Post.

* * *

With the announcement by the Standard Oil Co. of Indiana that its name will replace that of its subsidiary Midwest Refining Co. on all retail stations operated by the latter, it appears that one of the best trade slogans is to disappear. Midwest gasoline was advertised as "Mountain Made for Mountain Trade." Standard of Indiana products will be sold under their own name.

* * *

It has been demonstrated many times that reports of oil company mergers get publicity long after the proposed deal has been dropped. Such has been the case in the Amerada Petroleum Corp.-Standard Oil of Kansas conversations. It was published as a highly exciting development a few days ago. General Manager A. M. Blow, of the Amerada, promptly said there was nothing going on, that there had been some discussion quite a while back but that it was definitely off.

* * *

Paul Edkin, formerly with the Tulsa office of Babcock & Wilcox, has joined the Republic Supply Co.

* * *

Born: To Mr. and Mrs. Charles H. Pishny, of Tulsa, a girl. Mr. Pishny is a production and valuation engineer for the Amerada Petroleum Corp.

* * *

We have discovered, reading some of Senator Blaine's remarks, just why he was so bitter on the oil tariff question. Somebody, he charges, tried to "sell" him on the proposition while he was playing golf. Now, if there is a time in a man's life when he wants to be alone with his God it is when he is golfing. Some overzealous and quite ignorant person probably approached the senator while he was trying to get out of a bunker and forever ruined any chance of getting his support.

So great has become the telegraph business of the Skelly Oil Co.—third largest in Tulsa—that pneumatic chutes have been installed to carry the messages.

* * *

On April 1 a well known name passed out of the oil industry. The Shaffer Oil & Refining Co. became the Deep Rock Oil Corp. Products of the company have for years been marketed under the name Deep Rock and the company's name is now made to conform to the products. The Shaffers who founded the company, C. B. and the late J. K. D., have had no connection with the company for about nine years, or since they sold it to the Standard Gas & Electric Co., of Chicago.

* * *

Our Osage Indians, recently described by a lady novelist in a book with swell covers as multimillionaires, were paid $590 each for the first quarter of 1930. The going has been tough for the past two years and it is beginning to look as though Secretary Wilbur's idea of getting them to work would some day be effective.

* * *

Born: To Mr. and Mrs. Warren A. Sinsheimer, New York, a girl. Mr. Sinsheimer is manager of the oil production department of the Cities Service Co.

* * *

We find ourself referred to by John Naylor, of the Fort Worth Star Telegram, as a "Journeyman news writer." It is difficult to estimate the degree of insult implied by that, but so long as he doesn't call us a "layman" we shall not squawk.

* * *

The Foster Petroleum Co., which is controlled by H. V. Foster, who also is president of the Indian Territory Illuminating Oil Co., gets 1,250,000 shares of I.T.I.O. stock for the Oklahoma City properties it sold to the "Territory." This comes out of a new authorization of new stock, to be known as Class A non-voting, of which there will be 5,500,000 shares. The old stock, differing from the new in that it has voting rights, will be known as Class B. Both are no par value.

* * *

E. R. Osburn, chief engineer of the Texas-Empire Pipeline Co., has moved

from Lowry City, Mo. to Hayworth, Ill.

* * *

J. R. Munce, vice president of the Arkansas Natural Gas Corp., Shreveport with Mrs. Munce has gone to Honolulu on vacation.

* * *

Scientists say that a temperature of minus 350 F. prevails on that newly found planet in the next township beyond Neptune. About the same as Amarillo in mid-winter.

* * *

Several changes in land and geological departments in Oklahoma and Kansas come as the result of the recent acquisition of the White Eagle Oil & Refining Co., now the White Eagle Oil Corp., by the Standard Oil Co. of New York. Producing activities are gradually being transferred from this company to its sister subsidiary, Magnolia Petroleum Co., also a producer in Kansas and Oklahoma. Some of the changes noted are:

W. C. Willis, in charge of Magnolia's land office in Wichita, will have charge of that work in the western Kansas district, J. S. "Jimmie" Hughes, of the White Eagle office in Tulsa, will move to Wichita and handle the eastern Kansas district.

E. P. Philbrick, White Eagle geologist, Tulsa, moves to Wichita to head the newly established geological department of the Magnolia. Fred E. Mallonee and H. K. Phipps, of the White Eagle production and pipe line departments Wichita, will continue with Magnolia as will Irwin Turner, White Eagle scout and William Sevier, of the accounting department.

H. H. Royer, head of the White Eagle land department, Wichita and C. A. McAdams, chief geologist, both of the Wichita offices, are leaving the organization May 1.

* * *

T. B. Slick has inaugurated a producing experiment in the Sellens pool, Russell county, Kans. The three producing wells owned by Slick, Pryor & Lockhart, Inc., will be pumped 10 hours each day. Labor and production costs will be reduced thereby.

* * *

A lusty cheer for Ford Turner, of the Pure Oil Co.'s West Texas land department. He made a hole-in-one at the San Angelo Country Club. It was a 142-yard shot.

* * *

Lang J. Fullagher, of Wichita, will leave soon for Russia, where he will be occupied for some months on refinery construction under contract let to the Winkler-Koch company. He will be accompanied by his bride, the former Miss Margaret Irene Cole. Their marriage occurred in February. Mr. Fullagher formerly was superintendent of the Skelly Oil Co. refinery at El Dorado.

* * *

This department is asked by a friend to give advice on stenographers who sing at their work. We have no opinion, so we pass the query along. It seems that the time-honored remedy of firing is not to be resorted to. She is a good stenographer and, furthermore, good looking. Her singing disturbs other folks and is not especially tuneful. What to do, what to do?

* * *

Mid-Continent Petroleum Corp. has announced an employes' stock purchase plan. The company matches the employe's purchase money with one-third of that amount. Jacob France, president; E. M. Rouzer, vice-president and secretary and Charles Klein, treasurer, are the trustees of the plan.

* * *

The six-day week has formally been put into effect by the Indian Territory Illuminating Oil Co. Wherever possible men will be given Sunday as their day of rest; those who work on Sunday will be given another day of the week. There is almost a complete cessation of trucking by the company on Sunday, leaving the highways freer for the folks who are out for pleasure.

* * *

C. B. Wrightsman, of Los Angeles, has been elected a director of the Standard Oil Co. of Kansas. He is a son of C. J. Wrightsman, prominent oil producer, Tulsa, and candidate for the Democratic nomination for United States senator.

* * *

Well, Well! Who should take up this chain store fight started some months ago by "Hello World" Henderson, of Shreveport, but E. P. (Tex) Jones, of Okmulgee, oil producer and drilling contractor. Mr. Jones took the air over the Henderson station recently and later appeared in Okmulgee under the auspices of the Minute Men of that city.

* * *

A. J. Jeffery has resigned as a member of the supreme court commission of Oklahoma to join the legal staff of the Indian Territory Illuminating Oil Co.

* * *

J. Garfield Buell, who discovered the Valley Center field north of Wichita and later sold his minority interest to the Continental Oil Co., returned recently from a cruise in the West Indies. Mr. Buell is head of the Bu-Vi-Bar Petroleum Co. With his return, Seth Herndon, vice-president of the company, who lives in Wichita, with Mrs. Herndon left for a Mediterranean trip.

* * *

O. M. Bounds has been made manager of the aviation sales division of the Continental Oil Co., succeeding Ray Shrader, who resigned to go with an aviation company. Continental recently bought a third airplane for its fleet, a three-place Curtiss-Robin monoplane being the newcomer. Mr. Bounds was with the old Marland Oil Co. for several years. He was an army pilot and was one of the early air mail flyers.

* * *

The General Machine & Tool Co. has installed shops just south of McPherson, Kans., to serve the companies operating in that active area. The company is headed by D. M. Shawver, oil operator, Augusta. This shop is the third owned by the company, others being at Augusta and Valley Center, north of Wichita.

* * *

J. L. Shakely, vice-president of the Frick-Reid Supply Corp., wrote to the Mid-Continent Oil & Gas Association a suggestion for increasing the consumption of gasoline. He believes if companies would give employes a little more than the customary two weeks' vacation, they would take longer automobile trips. Specifically, he suggested one extra day for each five hundred miles traveled over the first five hundred miles, with a limit of three extra days off.

Mr. Shakely also suggested that if more employes would take their vacations early in the spring or late in the fall, it would result in greater gallonage, as they would be doing considerable summer driving also, and would distribute the highway travel over a greater period. It sounds quite feasible.

* * *

Harold Bosworth, formerly of the accounting department of the Marland Oil Co. and later the Continental Oil Co., is now associated with his father C. M. Bosworth, one time vice-president of the Fidelity National Bank, Oklahoma City, in the loan and investment business there.

* * *

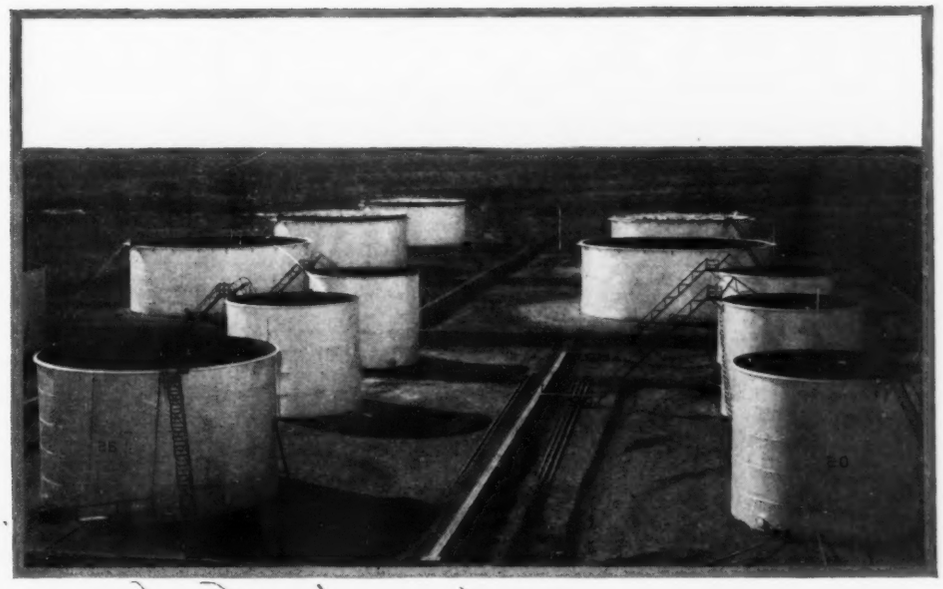
Plaintive note from A. W. Peake, new vice president of the Standard Oil Co. of Indiana, on being invited to bring his weapons when he next comes to Tulsa: "I doubt if I will ever be able to use my golf clubs again."

* * *

Barnsdall Corp. Stockholders, as of the middle of January, totaled 11,618. The stock market slump brought more investors in this stock, as the gain from Oct. 7, 1929, was 3185. New York leads the list with 3,252 and Pennsylvania is second with 2,918.

* * *

W. W. Runkle, former representative of the Hazzard Wire Rope Co., out of Fort Worth, Texas, has recently been made sales manager for that company in the Mid-Continent district, with offices in the Petroleum Bldg., at Fort Worth. Mr. Runkle has had a wide practical experience in various oil fields and though he will learn to like his new territory, he still thinks in terms of Wyoming, at least from a fishing standpoint. The new Tulsa representative of the Hazzard is Tom Massengill, formerly of the Landreth Production Co., who will take over the Oklahoma and Kansas district.



IF YOUR EVAPORATION LOSSES were waste steam instead of oil vapor —

If the valuable vapors lost by evaporation through air-leaky tank roofs and vents of gastight roofs were waste steam, it would make a cloud big enough to demand instant action. Why ignore a big loss just because it takes place invisibly?

A working tank, for instance, handling 10,000 bbls. per day of motor fuel gasoline loses 6,500 to 9,710 bbls. a year when equipped with an ordinary "gastight" roof. A Wiggins Floating Roof cuts this loss to about 300 bbls. annually—a saving sufficient to pay for the roof in a few months. On field or marketers' storage tanks, Wiggins Breather Roofs stop breathing losses in a similar manner. Both types of roofs remove fire hazard.

Let us quote you on re-roofing your present tanks with Wiggins Roofs or on new tanks completely equipped. Data on evaporation savings gladly furnished. Please address our nearest office.

Chicago Bridge & Iron Works

Cleveland.....2206 Union Trust Bldg.
New York..3145 Hudson Terminal Bldg.
Philadelphia.....1614 Jefferson Bldg.
Boston....1516 Consolidated Gas Bldg.

Chicago...2125 Old Colony Bldg.
Detroit.....1513 Lafayette Bldg.
Birmingham..1534 50th Street, N.
Dallas.....3339 Magnolia Bldg.

Atlanta.....1050 Healey Bldg.
San Francisco...1060 Rialto Bldg.
Seattle.....L. C. Smith Bldg.
Havana, Cuba.....Apartado 2507

WIGGINS ROOFS

Ocean Well Off Elwood Terrace Producing 7500 Barrels

By Jack N. Westsmith
N. P. N. STAFF WRITER

LOS ANGELES, April 4

ELWOOD TERRACE, along the coast northwest of Santa Barbara, claimed the attention of oil operators on the Pacific Coast during the past week. Pacific Western Oil Co. completed its tideland permit well 94-4 in this area for an initial production of 4706 barrels of 37.2 gravity oil from a depth of 3353 feet. At latest reports the well, which is located on a pier nearly 1000 feet offshore had cleaned up and was making 7500 barrels of oil and 1,400,000 cubic feet of gas.

Pacific Western's new completion is thought to be on top of the structure that is known to extend out into the ocean from the main field of Elwood, discovered in 1928 by Rio Grande Oil Co. The project will be given a 6-day flow test to determine its ultimate potential, after which it will be beaned back in accordance with the statewide curtailment program. Field reports state that approximately 300 feet of oil sand has been penetrated.

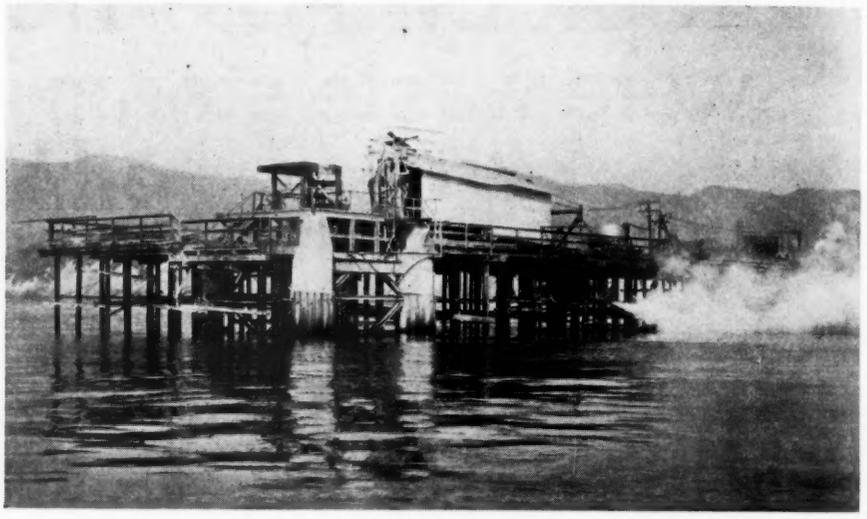
Several other companies with wells within striking distance of the pay sand on tideland permits at Elwood are expected to boost the field's daily average output to nearly 50,000 barrels although the present daily allowable is only 34,908 barrels.

General Petroleum Corp. is drilling at 3087 feet in its Crandall No. 1 in the Goleta district southeast of Elwood. This well is being drilled in search of another productive horizon thought to exist in the Vaqueros formation similar to that found at Elwood. General's More No. 2, which was recently killed after it had blown in as a gasser has revived the hopes of operators that an oil field will be discovered in this district.

The More No. 2, bottomed at 4327 feet, made nearly 75 million cubic feet of slightly wet gas per day before it was killed. Although there was no oil, operators are of the opinion that a productive oil sand may be picked at a lower depth.

Standard Oil Co.'s 81-11P on the north dome of the Kettleman Hills came in for its share of attention late in the week when it was completed at 7035 feet. Although no actual gauge has been made of the production it was estimated that the well was making approximately 60 million cubic feet of gas per day.

This completion gives the field 5 producing wells, 4 of which are on government permit land and, therefore, governed by the Kettleman Hills conservation agreement. The remaining one, Felix No. 1, drilled by Petroleum Securities Co., on fee land is now making 1200 barrels of 60 gravity oil and 29,700,000 cubic feet of gas per day, from which approximately 23,200 gallons of absorption gasoline is being recovered.



C. C. Spalding's well drilled on tideland permit No. 93 in the Elwood field. This project offsets Pacific Western's recent completion on permit No. 94

The discovery well, drilled by Milham Exploration Co., is now making 2825 barrels of oil and approximately 80 million cubic feet of gas per day from a depth of 7236 feet. Standard's other offset to the discovery, its 8-1P is making 3735 barrels of oil and 124,900,000 cubic feet of gas. The remaining producing offset, Continental Oil Co.'s Elliott 12-8, the largest producer in the field is making 4704 barrels of oil and 132,670,000 cubic feet of gas from a depth of 6876 feet.

Construction work is nearing completion on Standard Oil Co.'s absorption plant located near the company's 8-1P on the north dome. The new plant will have a capacity of 130 million cubic feet per day. Standard is now recovering approximately 99,000 gallons of gasoline per day from 103,000,000 cubic feet of wet gas from its 8-1P.

A production test is due to be made during the coming week on a wildcat well being drilled by Standard at Point Conception, above Santa Barbara. With 8⅝-inch casing set at 4275 feet, a test will be made of some streaked oil sands cored between this depth and the bottom at 4371 feet.

Leasing activity is reported to be under way throughout the state and a number of important test wells will be spudded in during the next month.

Richfield Oil Co. recently leased 2700 acres north of Santa Susana in Ventura county, adjoining over 10,000 acres that the company already controls in this area. The new acquisition is by no means wildcat territory as there have been 15 wells drilled on the property, six of which after 16 years of production are still pumping 33 gravity oil from a depth ranging from 800 to 2000 feet.

Although several completions were made during the past week at Santa Fe Springs the lack of "oil kick" to the lower sands is becoming of vital concern to operators drilling wells originally spudded in with these deep zones as objectives.

General Petroleum Corp. completed three wells in the lower Buckbee sand for initial productions exceeding those obtained from recent completions in the Clarke or lower O'Connell zones. General's Santa Fe 152-D was brought in for 1460 barrels of

33 gravity oil from a depth of 5945 feet, its S. F. 160-A completed at 5970 feet cleaned up to give 618 barrels of 28 gravity oil and its S. F. 160-D started flowing with an initial output of 590 barrels from a depth of 5980 feet.

In comparison to these relatively high outputs from the shallower sands, The Texas Co.'s Baldwin No. 5 bottomed at 7885 feet had an initial production of only 300 barrels per day and the Elmer Oil Co.'s Jamieson No. 3 was completed at 7928 feet for only 200 barrels per day.

A survey of operations at Santa Fe Springs showed that at the close of the week there were 22 wells drilling above 7000 feet and 49 drilling at or below this level. A total of 274 deep sand producers had a combined daily output of 120,577 barrels or an average of 440 barrels per well.

Associated Oil Co., with 4 wells producing from the lower sand, led the field in average production per well, having a daily output of 1132 barrels per day from each well. Union Oil Co. was second with a production of 26,597 barrels per day from 31 wells giving an average of 858.

In addition to this list of producing and drilling wells there are 102 wells off production either because of non productiveness or because of curtailment measures in effect throughout the field.

Even though the gas conservation law is not 100 per cent effective in the field, daily average production for the past week was 128,500 barrels. Certain concessions made by the court to independent oil companies have increased the daily allowable gas production to 304 million cubic feet, so that as a result production of crude oil will probably not be reduced below 115,000 barrels during the course of the preliminary injunction.

Statewide curtailment programs have combined to reduce the state's output to approximately 610,800 barrels, or only 7000 barrels in excess of the new allowable of 603,289 barrels per day set by the fact finding committee for April.

Umpire H. P. Grimm announced the following figures to govern production from the eleven fields in the state under his control during April:

Field	Estimated Potential B/D	Total April Potential	Total April Allotment	*March Excess or Shortage	April Allowable Total	April Allowable Daily Ave.	% Cut
GROUP 1 (flush fields)							
Ventura Avenue	74,522	2,235,660	1,274,326	50,978	1,223,348	40,778	43
Elwood	66,976	2,009,280	1,145,290	98,041	1,047,249	34,908	43
Maricopa Flats	28,925	867,750	494,617	32,412	462,205	15,407	43
Mt. Poso	21,776	653,280	372,370	78,367†	450,737	15,025	43
Kern Front	21,560	646,800	368,676	14,043†	382,719	12,757	43
Round Mountain	10,573	317,190	180,798	51,583†	232,381	7,746	43
GROUP 2 (settled prod.)							
Midway-Sunset	89,616	2,688,480	1,658,340	.....	.....	55,276	38.4
Inglewood	23,000	690,000	552,000	23,464†	575,464	19,182	20
West Coyote	12,382	371,460	334,314	17,569†	351,883	11,729	10
Montebello	9,124	273,720	218,976	6,020	212,956	7,098	20
Fruitvale	7,402	222,060	133,236	69,702†	202,938	6,765	40

*Excess or shortage for March based on daily reports and are subject to correction by reports on pipe line runs.
†Under production.

Kettleman Hills Operators Seek Unit Development Plan

LOS ANGELES, April 4

ALTHOUGH inequities continue to exist through enforcement of California's gas conservation law that may impair the ultimate beneficial results to be obtained there is a growing conviction among executives of leading oil companies that with certain necessary modifications the law will prove to be one of the most constructive moves ever undertaken by the industry.

Attorneys of some of the smaller factions have indicated that they will endeavor to have the present injunction set aside because of its injurious effects by appealing to the Supreme court April 14 when the Santa Fe Springs hearing is scheduled to be continued.

Defendant oil companies at Kettleman Hills secured a continuance of the gas-law hearing until April 16 on an appeal made before Superior Judge Strother at Hanford, April 1. The appeal was made on the plea that if the unit or co-operative plans of conservation, now under consideration by interested companies, can be worked out, the state's problem of conserving gas production in this area will be simplified.

Following this order of continuance the companies have worked on a plan for unit development but there seems to be little hope of constructive action due to certain clauses in Government permits making it unlawful for the companies holding these permits to combine or take any action that might be construed as tending to set up a monopoly in the production of oil.

It is expected that whatever action is taken by the court in regards to Kettleman Hills, the oil to gas ratios will permit a necessarily larger volume of gas to be produced per barrel of oil there than in other areas because of the extremely high gas pressures encountered. Representatives of the Petroleum Securities Co., which drilled the Felix No. 1, now producing 1200 barrels of oil and 30 million cubic feet of gas per day, stated that any attempt to stop the flow of gas from this well would result in destruction of the well with a consequent loss to the lessee and lessor.

The seriousness of attempting to reduce gas production at Santa Fe Springs as called for under preliminary injunction recently granted by the Superior Court, was presented to operators in this field early during the past week when Wilshire Oil Co.'s Off No. 18 broke through a valve and caught fire. This well with a production of approximately 4 million cubic feet of gas and 800 barrels of oil per day was being beaned back to comply with provisions of the order.

With the gas production reported to have been reduced to approximately 800,000 cubic feet, the valve broke under the excessive strain allowing gas and oil to escape into the air. A flying piece of rock is thought to have generated a spark that ignited the escaping vapors. Although the well was later brought under control it was estimated that the damage amounted to $100,000.

Because of this disastrous result of attempting to obey an order that in some cases is thought to be of a confiscatory nature, the Wilshire interests are reported to have opened up their wells and will make no attempt to reduce their gas production to the figure of 22,576,000 cubic feet allowed under the injunction.

These interests, which have heretofore blocked any move to curtail production at Santa Fe Springs made a strong effort to obey the provisions of the order. With a production of 55,851,000 cubic feet of gas and 18,947 barrels of oil on March 22, prior to enforcement of the order, this company had reduced its daily output on April 2 to 31,053,000 cubic feet of gas and 11,763 barrels of oil.

There are any number of wells at Santa Fe Springs using surface equipment that will not stand the excessive strain developed in reducing the gas production to the desired figure of 304 million cubic feet. For this reason operators with valves in a questionable state of repair are proceeding with due caution.

Hearing of the order to show cause why operators at Signal Hill should not be restrained from "unreasonably wasting" natural gas will open before Superior Judge Hazlett, April 7.

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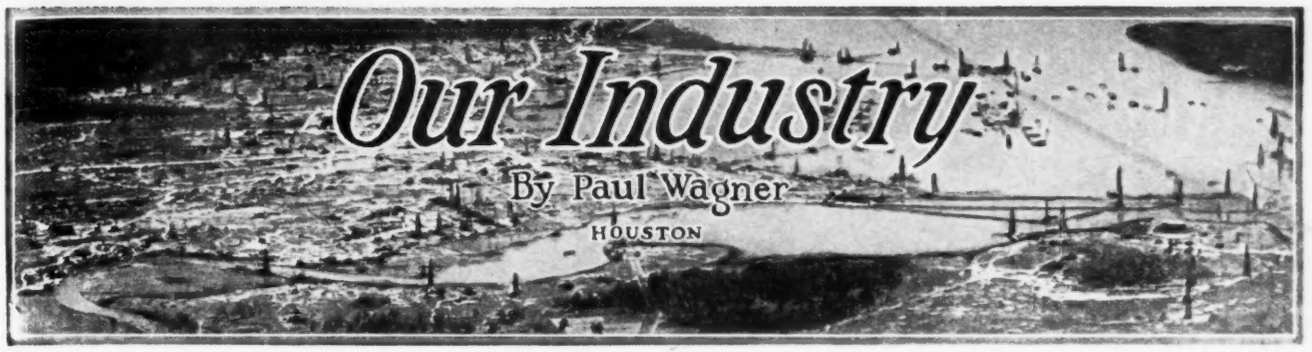


IN TEXAS there is a group of old-timers affectionately known as cowmen, because of their activities in building up the great cattle industry of the southwest. Foremost among the surviving group is W. T. Waggoner of Fort Worth, owner of vast ranches in the Wichita Falls district, where hundreds of thousands of cattle graze and many oil wells pour forth volumes of liquid gold. Mr. Waggoner also owns the Waggoner Refining Co., at Electra, and a skyscraper office building at Fort Worth. He is also a power in the First National Bank of Fort Worth. Thereby hangs the present tale.

The quickened temper of the southwest caused an unwarranted run on the First National Bank of Forth Worth one day recently, for what reason none has been able adequately to explain. Mr. Waggoner, in whom the Lone Star state places implicit confidence, made his appearance promptly; not soon enough, however, to beat the assemblage of thousands of persons clamoring for deposits.

Mounting an improvised rostrum in the bank, Mr. Waggoner pledged his entire fortune—variously estimated anywhere from $100,000,000 to $150,000,000—to repay anyone who lost a dollar through the institution. The run was soon quelled. Meantime, until the surging crowd could be quieted and turned homeward two orchestras were engaged for the evening, hot dogs and candies were served, and any customers of the bank who wanted to enjoy the evening at a show were given complimentary tickets to one of the motion picture houses.

* * *

Although many oil executives reach official positions via the legal department, it is less frequently the case that a lawyer becomes an individual operator. In the case of William J. Reiker of Fort Worth, he was chief counsel in Texas for subsidiaries of the old Marland Oil Co. of Delaware before engaging in business for himself. Mr. Reiker continues to function as an oil lawyer at his offices in the W. T. Waggoner building, but most of his time is devoted to lease trading and operations on his own account.

* * *

Ed W. Owen is in charge of the Wentz Oil Corp.'s offices in the Milam building at San Antonio. He was transferred to the Alamo city shortly after a recent inspection trip made by Mr. Wentz into the southwestern Texas territory.

* * *

Roderick D. Burnham of the Union Oil Co. of California land department recently returned to Los Angeles headquarters after an eight-months trip to South Africa with his family and his parents, Major and Mrs. Frederick R. Burnham. On that trip, "Rod" carried motion picture cameras for the photographing of wild life in which both "the major" and he are interested. "Rod" was born in the Mashonaland-Matabeleland region of South Africa, where his father won an enviable record in the empire-building days of the late Cecil Rhodes, prior to "the major's" service in the Boer war as chief of scouts for Lord Roberts. The trip of the three generations of the Burnham family ("Rod's" daughter representing the third generation) was, therefore, doubly interesting for those participating.

William J. Reiker

* * *

When the Texas Cities Gas Co. was purchased by the Lone Star Gas Corp., last winter, Henry C. Morris became its president. He now has active supervision of the company's operating policies. Mr. Morris' activities also include oversight of the Guthrie Gas Service at Guthrie, Okla., and the Northwest Cities Gas Co.

* * *

Paul Hunter, widely known in southwestern geological circles, has been transferred to Houston in the capacity of assistant to A. T. Schwennesson, Gulf Coastal division manager of the Shell Petroleum Corp. He had been previously located at Muskegon, Mich., in a geological capacity. Before joining the Shell organization more than a year and a half ago, Mr. Hunter was Abilene district manager of the land and geological departments for the old Marland Production Co. Before adjustments in that organization, which caused a realignment of operating forces generally, he had been assistant chief geologist of the older Marland Oil Co. of Texas.

* * *

The annual report of T. H. Barton of the Lion Oil & Refining Co., issued from El Dorado, Ark., headquarters, shows a steady advance toward general enlargement of operating scope. The company now owns in excess of 42,500 acres of undeveloped leaseholds in Arkansas, Louisiana, Texas and Mississippi. It also operates producing properties in Arkansas and West Texas, having taken over in 1929 the proved acreage in the Winkler county field of the Permian salt basin region that was previously held by the Pure Oil Co.

* * *

J. E. Duff, formerly of the Vacuum Oil Co.'s land department at Houston and later an individual operator, is now connected with the East Texas staff of the Pure Oil Co. He is spending most of his time in the Van area of Van Zandt county, representing the land department.

Oklahoma City Pool Gets Good Start at Town-lot Drilling

OKLAHOMA CITY

WHAT a merry time will be had in the north end of the Oklahoma City pool this summer!

Development there has entered tentatively the town-lot stage. That character of drilling has been missing from Oklahoma for several years. Until a few months ago when some close spacing was indulged in on the townsite of Earlsboro, the many pools of the Seminole district had been uniformly drilled on the basis of one well to 10 acres.

The Oklahoma City pool has plainly gotten away from the companies who tried to hold it down to a sensible operating basis. There was the failure in the beginning to obtain agreement to drill the field one well to 40 acres. Several of the early ones, including the discovery, were so spaced but nearly all the wells now in are one-to-ten.

That would not have been so bad, though, if the field had not run into the sub-divided and platted area adjoining the city on the east and southeast. In the beginning nobody, probably, figured the productive zone would extend north as far as it has gone. It has reached about 3½ miles northwest of the discovery well and, judging from the pep displayed by the outpost well on the north when it came in late in March, the end is some distance away.

The situation now existing in the extreme north end of the present defined field is at its worst in 1-11-3W. Several good sized leases are held by large operators in this section. Then there is a world of the sub-divided acreage where leases on tracts ranging from 10 acres down to a few town lots have been obtained.

The smallest plot on which a well is now being drilled is that of Reynolds and others on four lots. The well is in nearly the exact center of a square formed by four standard 10-acre locations. Every foot of surface on this "lease" is taken up by the derrick, boilers and slush pits. The water tank sits on part of the public highway. This location is practically certain to produce. It is a quarter mile west of the big well drilled in by Heenan & Coe in March. The latter is the farthest north well in the field.

There is no room for tankage on the Reynolds location and the owners have been unable to get any of the neighbors to lease them enough surface for flow tanks when and if the well comes in. Therefore, say the crew, the intention is to timber over the top of the slush pits and put the tanks there.

The really humorous thing about this operation is the fact that one town lot lies between the edge of the Reynolds "lease" and the highway. This belongs to Jack Shaffer, who has all of the 10 acres except the four lots the Reynolds well is on. A line fence was put up to mark the edge of Mr. Shaffer's lot and the edge of the dike of the slush pit follows this fence. In putting up the dike and excavating the pit, some of the earth rolled down on the Shaffer lot. The workmen were instructed to keep it cleared up and the Shaffer lot is in orderly condition.

Besides the one producing well in this section there are 20 operations under way. Fourteen of them are in the southwest quarter of the section, which would seem to leave room for only two more, on normal well spacing. Old Sec. 1 is to be given a fit, it seems, for there are plenty of locations left.

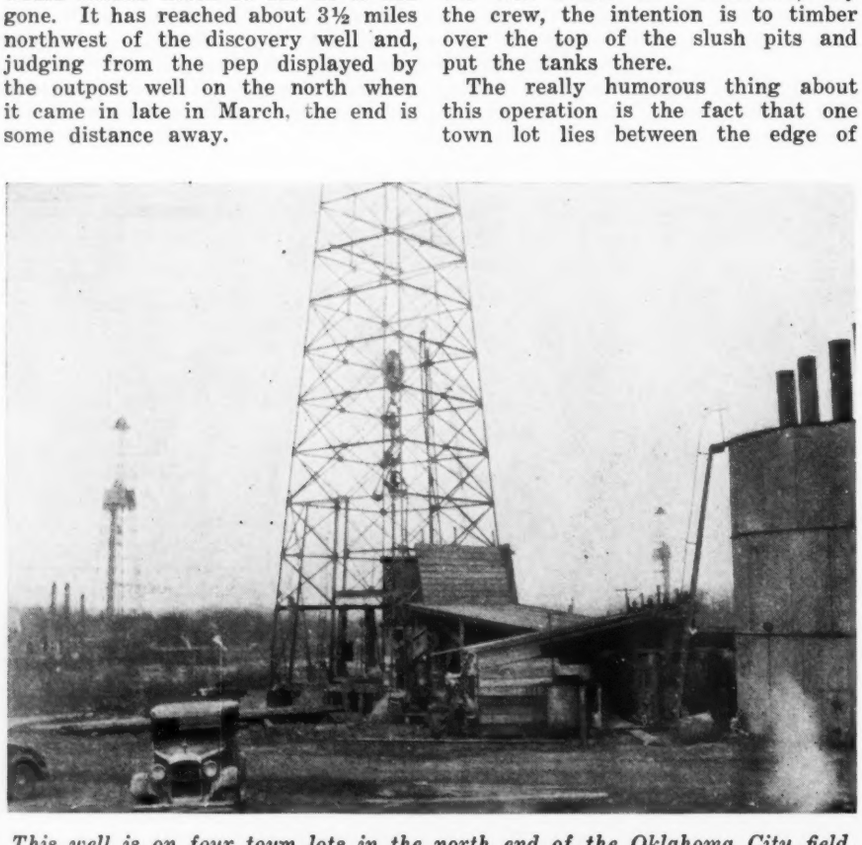
Off west and northwest of this hotbed there are many more of these little plats. A number of wells in this general north end of the field are being drilled on five-acre locations. One superintendent remarked to the writer last week, "Well, we have made our start in Oklahoma City—spudded today."

"I suppose you are all set on acreage."

"Hell, yes, we have a big lease—10 acres. That's almost unit development out there."

Still the development crawls north. If it swings over into the city limits it will be another Signal Hill all over again, except that the city will attempt to hold it to some such figure as one well to the city block. That would be excessive, considering the cost of the wells, which is around $150,000, but it would be better than the type of development where they simply "rig up on top of themselves."

The northwest part of the field is a hodge-podge of small farms—truck gardens, chicken farms, the odds and ends always to be found at some edge of a large city. There are numerous little shops, garages, hot dog stands, filling stations, etc., in one part of the zone where production is almost certain to be found. Supply row was established after the discovery well came in at a distance far enough from what seemed to be the development area that the supply men thought they were safe. Now the derricks are springing up right in the back yards of the equipment houses and it looks as though it will be moving day for some of them before long.



This well is on four town lots in the north end of the Oklahoma City field. There was barely room for everything

Pipe Lines Repaired by Arc Welding While Carrying Full Load

By John Power
N. P. N. STAFF WRITER

PERRY, OKLA.

RECONDITIONING oil pipe lines carrying a full load of crude oil at 350 pounds pressure by arc welding leaky collars, filling corrosion pits with welding metal, and patching pitted joints is being done successfully and safely by the Empire Pipe Line Co. No accidents of consequence have been recorded in the 28 miles of line which have been treated by present pipe line crew now working out of Perry, Okla.

During the reconditioning of the line now being worked over, the Empire's 8-inch line from the Cimarron station at Guthrie to the refinery at Ponca City, patches covering a total of 2694 feet have been put on in the 28 miles so far completed. On the same stretch of line 3669 joints have had the pits filled with welding metal. And 1240 leaky collars have been roped. In addition, 170 sleeves have been welded over collars too far gone to be roped.

Up to the arc welding stage, the Empire's method of reconditioning the pipe line follows the generally accepted practice. The line is uncovered, and swung up out of the ditch. It is gone over by the cleaning machine, which knocks off the scale and dirt, and reveals the corroded parts of the line.

The line is then inspected, and the pit holes, bad collars, etc, marked. The Empire has found that up to half a joint or about 10 feet economy lies on the side of the patch. If more than half a joint is in really bad shape, it is cheaper in the long run to cut out the joint, and replace it with a good one. How this latter condition is met without really taking the line out of service will be told a little later in this article.

The arc welding outfits are spotted by teams, and are so located that the welders can work about 400 feet each way along the line from the generators.

Each welding outfit runs one welding Electrode. A generator is mounted on a chassis, which is in turn set on a specially constructed bed on wheels. A four-stage switch controls the amperes sent out along the lead wires to the torches. The ground connection is placed on the pipe line at any convenient place.

No cleaning of the pit holes other than that given by the ordinary cleaning machine run over the entire pipe line is necessary. In fact, the corroded material seems to act as a flux when the torch is applied, and the welding metal is applied. Experimental welds have been cut open, and the bond found to be satisfactory in all cases where the welding had been done properly, workers said.

In general, it is considered safe to weld pit holes in a line under pressure when the pit holes are not more than half way through the wall of the pipe; there have been instances, however, of the arc burning through to the oil, and a fire resulting. So fast does the arc welding work, however, that not more than a pint or so of oil has escaped, and no damage has resulted.

In places where the pits are deep, they are apt to be too numerous to make filling each separate pit economical. When this condition is encountered, a sleeve, or patch is applied which covers the entire affected section. The patches are made of old pieces of pipe of the same size as the line. A supply is made up in various lengths from joints which may be unfit for service as a whole, but parts of which are in good condition.

The patch is placed over the affected part of the line, and driven on tight. It is then welded to the line, at the ends and at the sides. Experimental line pressure tests have been conducted, and pressure as high as 2200 pounds have been recorded without the patches failing.

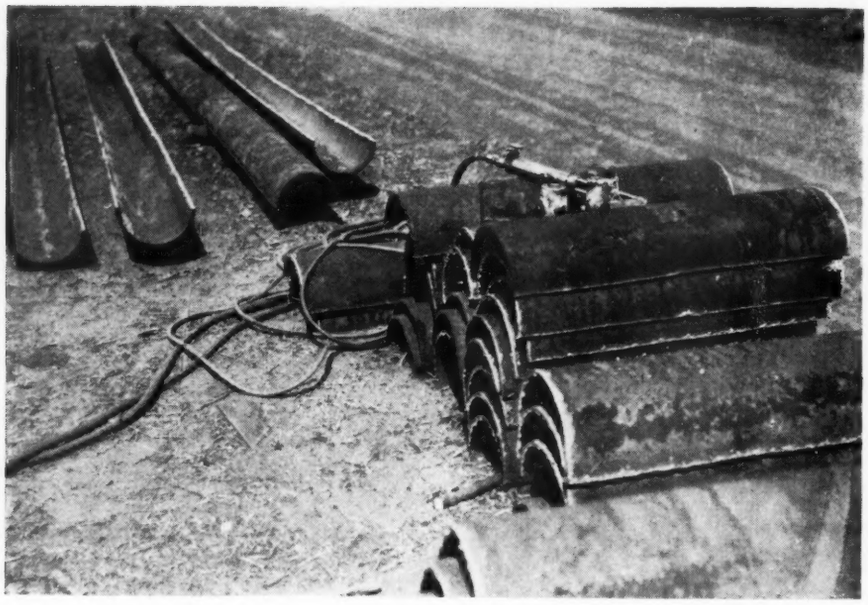
The collars are "roped" in the same way as that in which the pits are filled. The process consists of arc welding the collar to the line, thus effectively sealing off any leakage that worn, or corroded threads might permit to pass from the line.

Collars which are in too bad shape to be roped, or through which the leakage is great enough to make it dangerous to weld near it, are covered by the sleeve, which effectually seals off the leakage.

The sleeves are stampings, and are designed to fit snugly around the pipe, but have a bulge in the middle to provide room for the collar. They are about 18 inches long, and protrude far enough beyond the edges of the collars to give plenty of margin between the arc and any leakage which may be taking place.

The ends of the sleeve are welded to the pipe, and the seams made by

Sleeve which has been placed over leaky collar. When finished, the ends of the sleeve will be welded to the pipe. Picture shows the welding partly done at one end



A supply of patches made up in advance to be applied to lengths of badly corroded pipe

the joining of the two halves are welded together. These sleeves have been tested to pressures far beyond those under which it would be possible to operate any pipe line, and withstood such pressures at all times.

When the pits have been filled, and the patches and sleeves are in place, the attention of the reconditioning crew is then turned to the pipe which is so bad that it evidently has to be cut out and replaced.

Arrangements are made to put a slug of water in the line, 5000 barrels or so. When the water has reached the line in the sector containing the bad joints, the line is cut at some low point. All the bad joints are cut out at one time with oxweld torches, and new sections oxwelded in place.

The arc welding has been found by the Empire to be highly satisfactory in the application of the patches, filling pit holes, and the rest of the repair work. The arc welding method is so fast that an ordinary size corrosion pit hole can be filled in about 15 seconds. The parent metal does not get dangerously hot. The latter feature is extremely important in welding an oil-carrying line.

When the line is reconditioned it is given a primer coat, and then a hot coat of corrosion resisting enamel. It is then wrapped, put back in the ditch and the ditch filled.

The stamped sleeves used to cover badly leaking collars

May Delay Enforcing Pipe Line Law

HOUSTON, April 3.—Inability of Texas oil operators to further restrict crude production is more apparent than actual. Constantly mounting potentials of the Van and Darst Creek fields have brought these areas to possible producing level respectively exceeding 75,000 and 200,000 barrels of crude daily. Yet together the Van area in the east Texas Woodbine sand region and the Darst Creek field of the Luling fault zone are being exploited at only about 25,000 barrels combined production.

Week end completions at Van brought the cooperatively developed field total to 16 wells, the largest of which was the No. 3 tunnel on Shell Petroleum Co. acreage rated good for upwards of 11,000 barrels initial production. The policy of choking all wells in the field will cause exploitation to increase only slightly for the present from the 10,000 barrels daily being taken out.

At Darst Creek, where Magnolia Petroleum Co.'s M. E. Roemel tested at the rate of 34,500 barrels on a 32 minute guage the well has been shut down in conformity with prorating practice in the field. Although Darst Creek potential now exceeds 200,000 barrels daily the exploitation of the area continues at approximately 15,000 barrels.

Although hemmed in by legal restrictions in extending curtailment measures beyond those already in effect for months in various parts of the state a committee of the Texas division of the Mid-Continent Oil & Gas Association will continue recommending the drilling of as few wells as possible. A conference of the divisions general committee at Dallas March 28, agreed that nothing further could be done along curtailment lines in Texas at present.

From Austin comes the statement that the recently enacted pipe line bill sponsored by the Independent Oil Producers Association of Texas may not become effective despite the governors allowing it to become a law without signature. Availability of funds for administration of the law under conditions now applying in Texas may prevent its application when due to become effective in June.

Overproduction of Carbon Black

CLEVELAND, April 2.—Great expansion of the carbon black industry in the first half of 1929 and the falling off in the rubber business in the last half, has resulted in an overproduction. Stocks of carbon black have reached the highest point in history and are continuing to increase at a rapid rate. There were about a dozen plants under construction at this time last year, but building now has slowed down.

Salt Water of Oklahoma City Pool Being Stored and Evaporated

By William F. Lowe
N. P. N. STAFF WRITER

TULSA

THE salt water disposal system of the Oklahoma City pool is now in operation. A cooperative project, it serves the entire area and offers a solution to one of the most serious operating problems of that field. It was early conjectured that such a system would be necessary and the present plan represents the combined efforts of the operators to meet the situation.

The system is largely an adaptation of proven methods to local conditions though it has several features that are new to the industry. Salt water is being piped from the pool through eight miles of 20-inch line to large reservoirs where, either by natural or artificial means, it is to be evaporated. So generous have been the estimates of the engineers on the volume of water to be handled that both line and evaporating ponds should prove ample for all future needs.

The field end of the line is in Sec. 36-11-3W, on the southwest edge of the present active area and terminates in 31-10-3W, where the reservoirs have been constructed. At the service, of field end, a 20-inch manifold with several 8-inch connections has been placed. Meters have been installed on all of the latter for the purpose of measuring the water piped to the head by the various operators. Two companies, the Sinclair Oil & Gas Co., and the Indian Territory Illuminating Oil Co., are connected.

The latter company occupies rather a unique position in the scheme in that it has financed the project from the start. It assumed this position by mutual agreement of the operators in order that the emergency might be met with the greatest possible speed.

Owning, as it does, about 60 per cent of the total area of the pool, its needs were considerably greater than those of the other producing companies. This however, was not the determining factor in its assuming the responsibility of underwriting the construction. Rather, was it an expediency. The Oklahoma City organization of the I.T.I.O., was such that it could proceed at once, thus dispensing with the delays attendant upon the formation of a company among the operators.

The cost of the system is to be prorated among the companies that use it. Each will pay to the Indian Territory Illuminating Oil Co., a flat per barrel rate on the water they run, until such time as their proportionate part of the cost has been paid.

Individual operation statements will be submitted by the participating companies and from these their allotted cost will be figured by the engineers' committee. Fifty per cent of the amount due will be based on the potential salt water production of a company, 25 per cent on the acreage held and 25 per cent on the number of wells. In this way the distribution of the construction expense will be brought about in the most equitable way.

The line itself is so located that water brought to its head will gravity the entire distance to the reservoirs. In order to make this possible every advantage was taken of topography, with the result that 200,000 barrels per day can be handled without the use of pumps. If this amount should prove below the requirements of the field, it may very easily be doubled by forcing the water into the line under pressure.

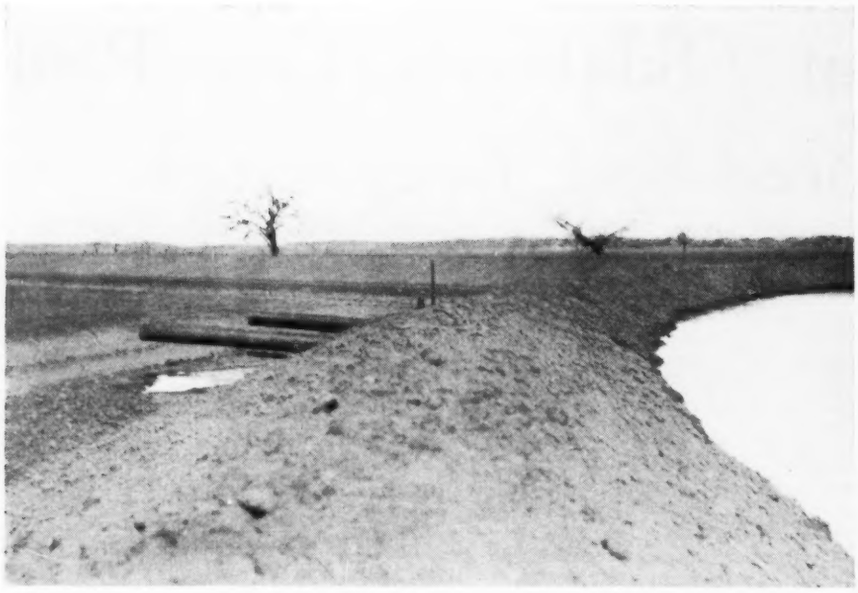
Because of the corrosive action of oil field brines on ordinary steel pipe it has always been necessary to either treat the metal to retard or avoid such action or to find a substitute for steel. The latter has been the usual procedure. At Santa Fe Springs, in California vitrified clay, 18 inch and 24 inch I.D. pipe was used, while in the Gulf coast and in Kansas, cast iron pipe has answered the purpose.

The original intention of the Oklahoma City operators was to lay a line made of treated wood tubes. Such a salt water conveyor would have solved the problem of corrosion but would have been capable of withstanding the pressures that will be put on this particular line.

Light weight, 20-inch, spiral weld steel pipe, possessing certain non-corrosive qualities and treated with a heavy coat of enamel, was finally used. The method of treating these 40 foot joints was a novel procedure and proved the feasibility of applying a protective coating on line pipe by dipping in the field. It required a rather extensive plant, which was set up on a siding, and a great deal of care was used in the process.

The pipe was first immersed in Biturine cold primer. After being thoroughly dried, it was dipped into a vat of Biturine enamel which was heated to a temperature of 400 degrees. Following this treatment it was kept turning until dry in order

Twelve-inch connection of the Indian Territory Illuminating Oil Co., at the head of the line. Note the gauge in the center. The curving water trap on the right, in these temporary connections, is to be used for the present to maintain a level in the line until such time as it being run to capacity. The manifold of the main line is underground behind and to the right of the trap



View at the reservoir end of the line showing the skimming pool on the right and the 20-inch bleeders to the first of the series of ponds

to assure an equal distribution of the coating. It was found by test that the thickness of the latter when completely dry averaged about three sixteenths of an inch and its weight per joint approximately 280 pounds..

Stringing and laying a pipe with such a coating was rather a delicate job. Inevitably some dents and scars resulted though unusual care was taken in its handling and it was necessary to keep hot pots of enamel handy to remedy the damage. The Victaulic couplings used were also heavily daubed both inside and out before the pipe was lowered.

Every company desiring to use the system is required to lay its own line to the head or to a main of another company already connected. In the event of the latter choice, a meter may be installed at that point to determine the charge against the producer. The water so transferred will be subtracted from the total gauge of the second company at the manifold. Such an arrangement tends toward the elimination of miscellaneous and random disposal of salt water by making the system available to all.

In order to reduce the amount of oil entering the system to an absolute minimum, skimming plants of sufficient size to handle individual runs are to be erected on the various leases. This could not be done in California because of the close spacing of the wells. As a result, it was necessary to build expensive community plants. Present indications are that the Oklahoma City pool will not be so different, at least in spots, for there seems to be an embryonic town lot drilling campaign on in the north end of the field.

As a further safeguard against the contamination of the reservoirs with oil, a large skimming plant has been placed at the lower end of the line. All the water entering the system must pass through this plant before entering the first series of evaporating ponds. This should result in the complete clearing of the water, even of oil scum.

The area covered by the first reservoir is approximately 120 acres though additional land has been purchased for the construction of others in the event they are needed. The ponds were formed by dykes thrown up around the flat lands.

A channel was thus created on the inner side of these great mounds of earth, in which an approximate depth of 10 feet will be registered when the water is at a high level. In the center of the basin however, the water will be much shallower and it is here that the major portion of the evaporation will take place.

In the event that the speed of natural evaporation proves insufficient, arrangements have been made for the installation of a system of gas flames immediately above the water. This method is quite commonly used in Texas.

It has been suggested that the salt water lake may eventually assume the role of a bathing resort. This is a possibility for there are few things more stimulating than a bath in concentrated salt water.

It has its drawbacks however, unless there is plenty of the fresh variety in the offing for rinsing purposes. Bathers are herewith advised not to use soap unless they can obtain the foot long bars of navy issue. Another economic idea in connection with this salt water body is the fact that it should be an ideal spot for the propagation of herring.

J. Gus Patton, chief civil engineer of the I. T. I. O. whose extensive activities in the Mid-Continent are marked by another accomplishment in this line

University Lands Sold Oklahoma Operators

HOUSTON, April 2.—Skelly Oil Co. acquired an 80-acre tract of University of Texas land in the Judkins area of Ector county, at the leasing board sale in Austin, March 29, paying $77,775 bonus, $1 an acre yearly rental, one-sixth oil royalty and one-eighth gas royalty.

Transcontinental Oil Co., of Tulsa and Fort Worth, acquired a 160-acre tract in the same Ector county development area, for $96,000 cash bonus and similar royalties.

No bids were received on eight tracts on Andrews county lands withdrawn from the sale because of litigation affecting University properties north of Deep Rock development in the county named.

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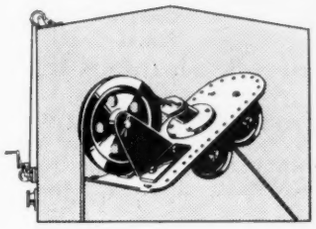
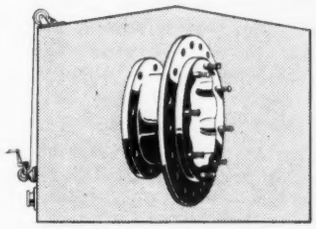
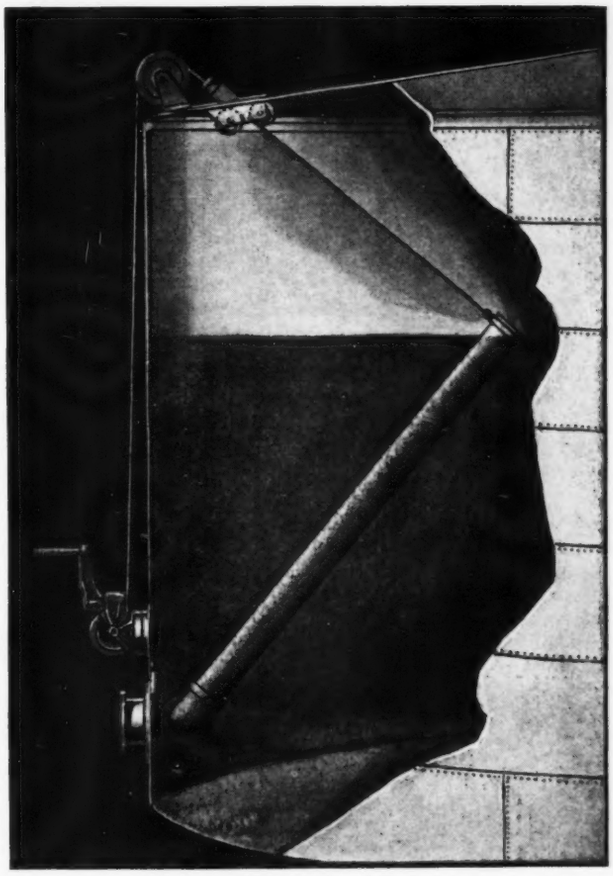
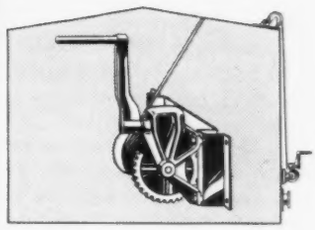


Cable Sheave Bracket. Brings the cable through a gas-tight stuffing box at an angle which prevents straining the roof.

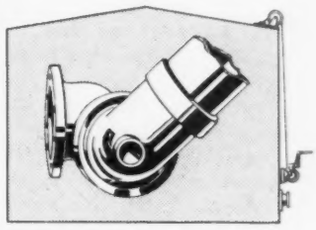


Cast Steel Tank Nozzle. With this type of connection, the swing joint is held absolutely rigid and requires no other support as in cases where a threaded connection is used. The single row of rivets reduces to a minimum the labor of mounting this nozzle and any chance of leakage.





Safety Tank Winch. This improved line of winches meets all requirements for swing lines of various sizes. They offer the utmost in convenience and safety.



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Do's and Don'ts for Shooting Given to Field Men

Staff Special

TONKAWA, April 2

ONE of the most important items for successful shooting is the co-operation between the superintendent and the shooter, Willis Hill, of the Shooters Torpedo Co. told the field men who attended the March meeting of the Tonkawa chapter of the American Petroleum Institute, Division of Production, held in Tonkawa March 19.

In addition to outlining what he believed to be good practice in shooting under various conditions, Mr. Hill also gave his hearers some safety hints which his long experience as a shooter had taught him might be carried out with assurance.

When an explosion on top of the ground appears imminent, LIE DOWN, he said, don't try to put distance between you and the danger. By lying down on the ground missiles blown through the air can be avoided. The chances of being burned are not great, he said, as the ball of fire from a nitro explosion does not travel far.

When a well is to be shot that is flowing by heads, Mr. Hill said that it was good practice to pass a double cross of rope over the control head. This would catch the shell, should it be blown out of the hole. It would aid in getting the shell started back down the hole while there was still sufficient pressure after the flow to slow down its fall.

Don't use tin shells where acid has been used to cut away a fishing job, or to soften hard lime, he said. The heat would attack the shell, eat a ring around it through which the nitro might leak. The friction of the nitro passing through the frayed wire screen base of the shell might be sufficient to set off the charge.

Leave a 6-inch expansion space at the top of all shells, he said. Increased heat might cause the fluid to slop over the top of the shell, with disastrous results. A little ball of mud placed in the top of the shell will keep out floating sand, parts of swab rubbers, etc., said Mr. Hill.

Don't visit with the shooter while he is working. He has his hands full tending to his own job, and the safety and success of a hole which has been an expensive proposition to drill may depend on his concentrating on what he is doing. All walking, or working on the walk parallel to the shooter's line should cease after he has hung his shell.

To clean up loose nitroglycerin from the derrick floor, rig irons, etc. Mr. Hill recommended that dry sand be used as an absorbent. Sprinkle the spilled "soup" liberally with sand, and after a few moments spread it over the spot with either a stick, or by hand. When the sand will absorb no more, it can be safely swept up and thrown away.

"It is desirable by most shooters," said Mr. Hill, especially where they are not known, to have a witness while they are pouring stco to avoid any suspicion of trickery in the event the shot does not act according to expectation. When shooting at low rock pressures, at or near crevices, with the gas just right to fool the producer when putting in water tamping, and thereby burning the sand—the expected does not always happen. These freak conditions have dehorned many a good shooter, and lost him his job."

When a shot is being tamped with water and where there was oil in the hole, Mr. Hill said that it was good practice to run the bailer after the water had been run to be sure that the water had got down through the oil. The bailer should be run to a point close to the shot. In this way, he said, it was possible to prevent excessive burning of the sand by the nitroglycerin.

Nitroglycerin shots have been used successfully he said, for many reasons other than merely helping the production. One such example that he gave was the use of a small shot to kink a drill stem lost in the hole so that the upper end would fall over into the hole. After such a shot a picture block should be run to insure the using of the correct fishing tool.

In planning a shot, Mr. Hill recommended that careful consideration be given to the rock pressure, porosity of the sand, whether or not the tools mud up easily, as well as the more commonly considered questions of the thickness of the sand body and the proximity of water.

In selecting the type of explosive to use, Mr. Hill said that "What is needed is the quick, deep, penetrating shot that does its work so cleanly that there is no crushing or mudding effect."

A.I.M.E. to Meet at Norman

TULSA, April 3.—The Mid-Continent section of the American Institute of Mining & Metallurgical Engineers will hold a meeting in Norman, Okla., April 16 being the date tentatively set. A dinner and discussion of the Oklahoma fields will constitute the program.

Chairman Harry H. Power of the section announced the appointment of a program committee for this year. With Mr. Power as ex-officio a member, the following will serve: Harry F. Wright, consulting geologist; Raymond M. Carr, production engineer for the Sinclair Oil & Gas Co. and Lawrence E. Smith, of the NATIONAL PETROLEUM NEWS.

The United States exported by far the largest quantity of lubricating oils to British India during 1928. Of its total imports of this product, which amounted to nearly 300,000 barrels, the United States shipped 227,000 barrels. The United Kingdom shipped 21,000 barrels.

Univ. of Oklahoma Offers Summer Field Course

NORMAN, Okla., April 3.—An eight weeks' field course in petroleum engineering from June 4 to Aug. 1 is being offered by the School of Petroleum Engineering of the University of Oklahoma at Norman, under the direction of H. C. George, director.

The course will consist of a study of operating methods in the greater Seminole area and in the new Oklahoma City field and should appeal particularly to eastern students, Dr. George says who have no opportunity close at hand to see the developments in deep well drilling.

A study of drilling methods, oil well completion and methods of production of natural gasoline plants and methods of treating and refining crude oil, and transportation methods for natural gas and crude will be included in this course.

Fee for the course is $50. Students expecting to take the course should signify their intention of doing so to Director George before May 10.

Book Review

ANOTHER welcome addition to the libraries of oil companies or to that of anyone interested in geology, is just off the press. It appears as the second volume of the symposium on geologic structure, held by the American Association of Petroleum Geologists, under the title of "Structure of Typical American Oil Fields."

Unlike the first volume, published some eight months ago, it is not confined to the technical papers given before the society during their twelfth annual convention at Tulsa in March 1927. Of a total of 40 papers which make up the current compilation, only 18 date back to that meeting. It is not meant to imply that the newer geologic discussions have any greater value than the old, for they are all

typical structures and were chosen for that reason. To operators however, it is very probable that the data on more recent fields will be of greater interest.

Western fields received considerably more attention in the new book than in the first volume. This is particularly true of the Rocky Mountain area and of California. Eight fields of the former are discussed in geologic detail, while a ninth paper, "The Relation of Accumulation to Structure in Northwestern Colorado," by Ross L. Heaton, covers seven small oil and gas domes in that area.

California is well represented with four well illustrated reports on as many fields. The Santa Maria district, the Ventura Avenue, Elk Hills and Long Beach oil fields being the ones covered.

The outstanding paper of the seven in the Oklahoma series is that of A. I. Levorsen, chief geologist of the Independent Oil & Gas Co., on the "Greater Seminole District." It is illustrated with 22 cross-sections and maps and is the clearest and most exhaustive study that has been made in the area.

The concluding paper of the book is one that can be read with interest and profit by anyone connected with the oil industry. Written by Frederick G. Clapp, internationally known consulting geologist of New York City, this summary entitled, "The Role of Geologic Structure in the Accumulation of Oil," correlates the information found in both volumes.

After classifying the structures of the known producing fields, the author illustrates the various types with examples taken from the text of the symposium. For the layman, this procedure not only aids in the classification of the typical structures given, but considerably clarifies the meaning of many geologic terms.

Both volumes of "Structure of Typical American Oil Fields" can be obtained from the American Association of Petroleum Geologists in Tulsa. The price postpaid for volume No. 1 is $5.00 while volume No. 2 sells for $6.00.

* * *

The Spectator Co., 243 West 39th St., New York City, announces the fourth edition of "Fire Insurance Inspection and Underwriting," a 1150 page volume in thin paper, flexible cover, price of regular edition $6.50. This volume is well illustrated and covers over 5500 subjects, 500 more than the third edition. These subjects embrace fire and special hazards of chemicals, processes and materials, standard insurance policy conditions and forms of insurance, definitions of insurance terms, effects of fire, etc., on different commodities. The work should be of value to insurance company officials, inspectors, underwriters, factory engineers, and others who need to have in reach detailed information of the subject treated.

Gas and Air Lift in Oil Production

In 57 articles in the past two years' issues, NATIONAL PETROLEUM NEWS has told of the use of air, gas and water in increasing oil recovery, application methods, and of restoring pressure to old pools.

Here are the articles for your file reference:

1930

First repressuring of depleted sand attempted Feb. 19, p. 46
New developments in flooding practice in Bradford Feb. 19, p. 30

1929

Repressuring at peak doubles lease return Dec. 25, p. 59
High gas volumes handled in repressuring Dec. 11, p. 44
Repressuring authorities cover wide range Dec. 11, p. 65
Tonkawa field men discuss repressuring Nov. 27, p. 39
Gas lift development in Seminole Oct. 30, p. 213
Mid-Continent repressuring practice Oct. 9, p. 48-B
Repressuring in depleted oil zones Oct. 9, p. 48-P
Repressuring successful in Burbank Aug. 21, p. 37
Gas lift practice of 15 companies in Seminole June 26, p. 62; June 19, p. 57
Water drive in Bradford speeds as technique improves May 29, p. 50
Keeping accident out of air-gas lift plants May 22, p. 59
Safety rules for operators May 22, p. 62
Automatic water supply for gas lift May 1, p. 64
Alcohol keeps gas lift lines open March 13, p. 66
Repressuring results in Bradford Feb. 13, p. 62; Feb. 6, p.51
Better recovery, cheaper lifting sought Feb. 13, p. 35
Pulsing air-gas cuts repressuring hazards Jan. 30, p. 60
Santa Fe Springs gets repressuring plan Jan. 9, p. 40
Lease returns cost of repressure equipment quickly Jan. 2, p. 29

1928

Archer Co. output may be increased by repressuring Dec. 19, p. 34
Back pressure increases yields Dec. 12, p. 43
Questions economic success of gas lift Dec. 12, p. 60
Unit repressuring effects savings Dec. 5, p. 65
Repressuring in Burmah fields Dec. 5, p. 62
Gas-oil ratio of 5000 ft. for Misener sand Nov. 7, p. 41
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Back pressuring advised for Santa Fe Springs Nov. 7, p. 42
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Repressuring slows down for winter Oct. 24, p. 44
Better use of gas in oil recovery Oct. 24, p. 24
Intermittent injection of gas in gas lift installations Oct. 17, p. 44
Economic effect of gas lift in natural gasoline industry Oct. 17, p. 130
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Flowing wells against pressure sands in Seminole Oct. 3, p. 56
Early repressuring in Cook pool Oct. 3, p. 26
Repressuring in Lima field Sept. 12, p. 51
Application of gas in plant control Sept. 5, p. 79
Avoiding extra cost in pressure rejuvenation Aug. 15, p. 38
Pressure rejuvenation in Powell-Stove Aug. 1, p. 25
Effect of operating methods on oil recoverable July 25, p. 50
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Water flooding not successful in Kane, Pa. July 4, p. 50
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Intermittent use of gas lift economical May 30, p. 69
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Results of pressure recovery in Bradford May 23, p. 25
Eastern field operators discuss repressuring May 23, p. 23
Repressuring oil sands May 16, p. 85
Fluid displacement pump used with gas lift Apr. 23, p. 100
Repressuring causes gasoline plants to close Apr. 11, p. 51
Effect of modern production methods on natural gasoline Apr. 4, p. 17

Back copies of any of the above issues are 25c a copy. On issues that are exhausted, photostats will be furnished at 40c per page.

Libraries in the larger cities generally keep back files of NATIONAL PETROLEUM NEWS complete.

National Petroleum News

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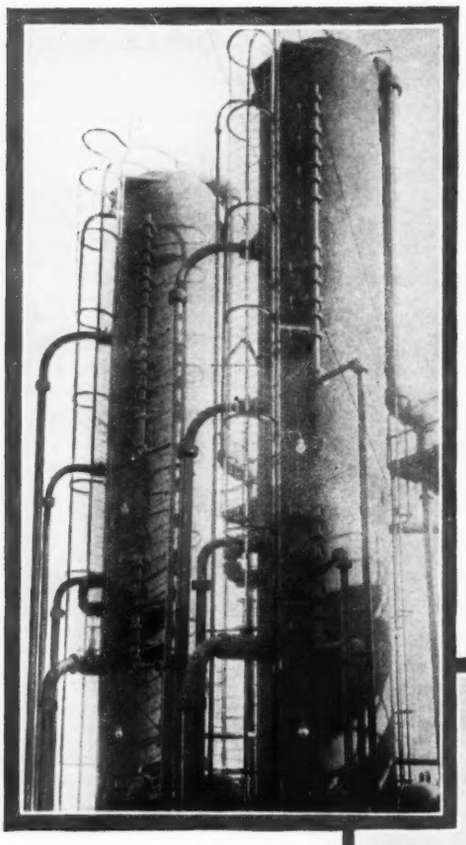
RESULTS



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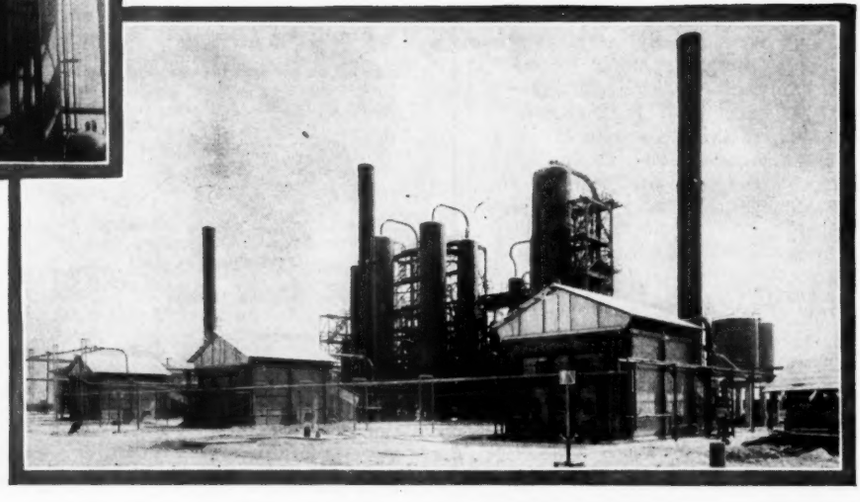

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ADVERTISING PAGES REMOVED

Remote Control At Refineries Facilitated by Application of Selsyn Motors

By Luis de Florez*

THE practice of refinery design over the past few years has, in a large measure, been made possible by the increasing facilities for control of various parts of the operation. Instruments of all kinds have been developed to permit greater knowledge of operating conditions and in many cases to automatically maintain the relationship of flow and temperature which are essential to economical and efficient operation.

Continuous processing, which has superseded batch operation almost entirely, has created the necessity for closer control and a careful matching of rates of feed to produce desired results. The satisfactory operation of either distillation units, cracking units, or treating plants is now, more than ever, dependent on the centralization to enable the control of processing by one mind and reduce errors which creep in, due to the division of responsibility.

The design of almost all refinery equipment involves a great deal of piping. The indications of the conditions throughout the system are registered or indicated by pressure gauges, pyrometers and various recording instruments. This part of the equipment has been developed fairly rapidly and the practice of installing the various instruments required for the process at a central point has now become a standardized design.

These instruments furnish the knowledge of what is happening in the system but as yet comparatively little has been done to transmit their readings into control. The control of the unit is effected by variation of valve settings which, in turn, operate either directly on the flow of oil, fuel or in the change of motive power of pumps or other similar equipment. It is generally necessary for the operators to note the conditions being maintained in the system and then issue orders to have these changed, when necessary.

The changing of any individual control requires not only the necessity of making a correction but careful judgment as to the amount of correction to be applied. In the complex systems developed to handle oil in large quantities, almost all the controls affect each other to some extent and the problem of an operating unit becomes one of balancing rates of flow in all parts of the system.

To those who have studied the operation of refinery apparatus, it will be evident that the man who observes the changes which take place in the system from time to time has by far the best opportunity of judging the extent of the change required in the controls. If the change required is then made through the intermediary of another operator, the extent of the change must be described by the first and interpreted by the second. If the correction is too great or too small a period of hunting will occur which is detrimental to the performance of the unit.

The ideal arrangement for centralized control would be to place in the hands of the operator in charge of the control panel a means of making his own corrections which he is in a better position to judge than another operator who merely receives an order to make a change.

In some cases automatic instruments are available to eliminate the necessity of making manual corrections, but there are many controls which are preferably controlled by manual operation and it becomes evident that some system of remote control from the board is a necessary link in the prog-

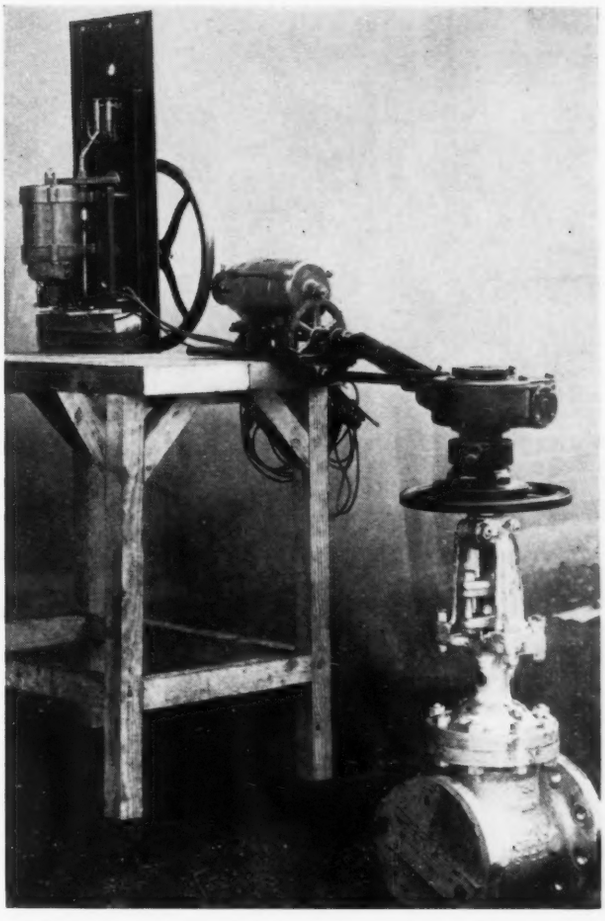

Fig. 2—Arrangement of transmitting and receiving mechanism applied to a valve

*Consulting Engineer, New York.

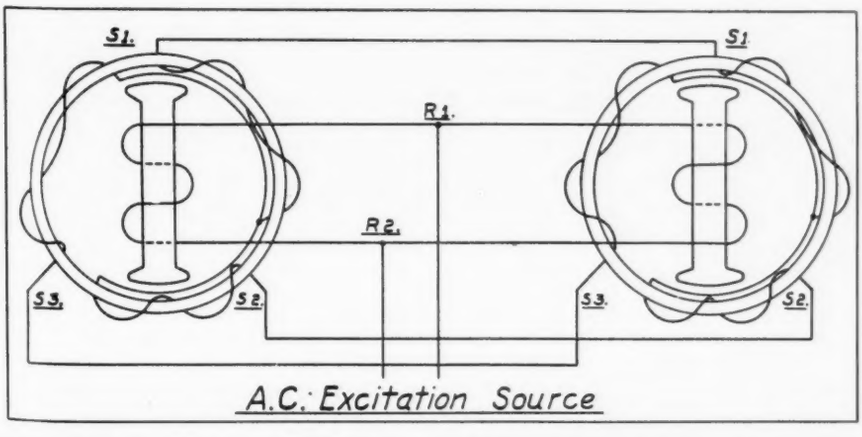

Fig. 1—Electric circuit for transmitting and receiving motors

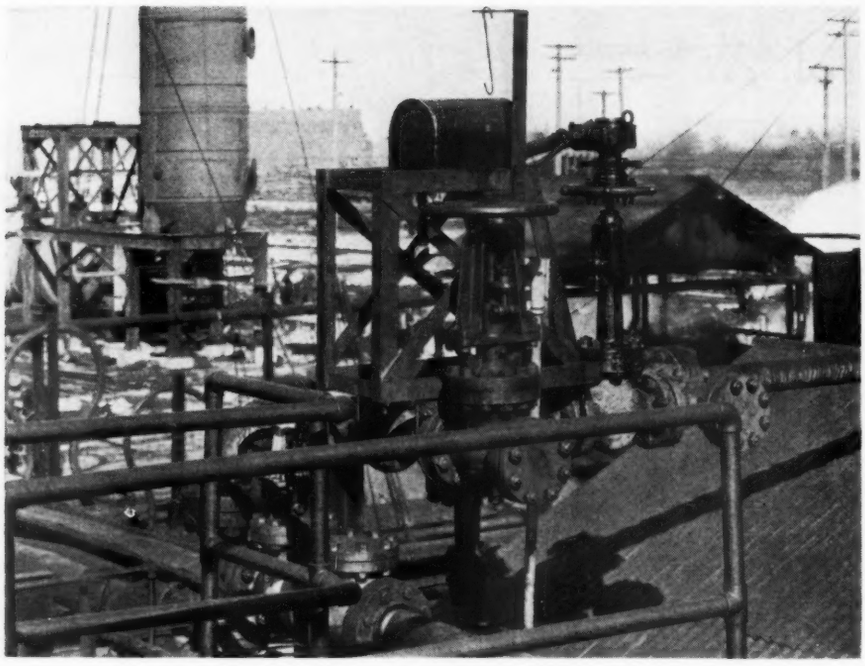

Fig. 3—Illustrating application of receiving motor at a valve in the refinery

ress toward centralizing responsibility for one operation or one operator.

Remote controls have been used in the past with mechanical connections, in some cases by hydraulic means and, to a less extent, electrical control. It is evident that the mechanical contrivances for producing motion at a distance are limited and this control must be made possible in many cases by diverting pipe lines to within reach of the control board or placing the control board in a favorable place to make the arrangement possible and, in point of fact, this is sometimes done much to the detriment of the situation of the control panel.

The electrical and hydraulic devices which have been used heretofore have not been particularly well suited for adjustment and in most cases merely serve to open or close valves at a distance, and are not suited to adjusting the operation. The ideal control is evidently one in which the receiving mechanism will follow accurately the motion of the transmitter in addition to which it is always desirable to have the resistance to motion felt on the transmitting end to be certain that undue force is not applied to the mechanism to be changed, thus avoiding possibility of breakage.

Bearing in mind the foregoing, a remote control device has been developed which uses self-synchronizing alternating current motors which have the property of remaining accurately in phase. When connected and energized any power applied to one motor will be transmitted to the other with comparatively little distortion and their action can not only be used to transmit indications but also to transmit power necessary to effect control.

The motors, known as Selsyn Motors, are a product of the General Electric Co. and have been heretofore extensively used in connection with fire control on battle ships. Diagram (Fig. 1) shows the connections for the electric circuit which connects the transmitting and receiving motor. These motors are entirely encased and are further gas proofed by suitable covers. The rotating shaft is mounted on ball bearings and can be used in any position. The motors are made in three sizes depending on the power required and whether the units are required for transmission of power or indicating mechanism.

It will be evident that the application of such a principle to refining equipment is a wide one and that the use of such mechanism not only permits greater ease in control from a central station but permits a great deal more latitude in the design of piping and equipment since the control of certain important valves can be effected without respect to their position in the system.

Figure 2 shows the arrangement of a transmitting and receiving mechanism as applied to a valve. The transmitting mechanism consists of a wheel through which the control is effected which in turn rotates the transmitting motor through a gearing. A point of mechanism is connected with the motion of the wheel to denote the amount the system is turned and a pilot light is incorporated in the unit to indicate when the circuits are energized.

The rotating of the transmitting motor causes the rotation of the receiving motor, the motion of which is transmitted through a gearing to a shaft and thence to a worm gear which is connected to a wheel on the valve stem. The worm gear mechanism is connected to the valve wheel by means of a clutch, half of which is clamped permanently to the spokes of the wheel, the other half being directly connected with the worm mechanism. A quick detachable clutch is inserted between the wheel and the worm case so that the mechanism can be disconnected quickly and at will.

It will be noted that the drive shaft from the receiving motor is flexible and that the mechanism can thus be applied to a wheel which is solidly mounted on the valve stem and which will rise and fall as the setting is changed. In addition to this, the worm gear is hollow and in the event that the mechanism is applied to a rising stem valve the stem can pass freely through the center of the worm.

The transmitting unit is made up in small panels roughly 30 inches x 16 inches and can be bolted through control panels or assembled in batteries.

The receiving mechanism can be applied to any type of valve or to effect any rotary motion desired. The power transmitted to the receiving mechanism is only that which is impressed on the transmitting wheel. Thus the resistance to motion can be gauged and the actual amount of correction observed on the wheel in the same manner as it would be observed in turning the valve itself. There is, of course, some loss in friction which is comparatively small and ample power is provided to start the valve from full closed jammed position when necessary.

The motors themselves, which can be likened to rotary solenoids, have of course a limited amount of torque which they can transmit without having the phase broken down. This torque can be amplified however by merely gearing up the transmitting motor and gearing down the receiving motor. Thus the power is transmitted at low torque and high speed and the extent to which the motors are out of phase becomes relatively unimportant since this amount, which may aggregate to 5 or 10 degrees, is reduced in proportion to the gear ratio. Thus, with a gearing of 100 to 1 on the transmitter and receiver, the valve wheel would move the same number of turns as the transmitting wheel, one turn of the transmitting wheel would cause 100 turns of the transmitting motor and correspondingly 100 turns on the receiving motor, the receiving motor also being geared down 100 to 1 would cause one turn on the valve wheel.

Furthermore, the extent to which the motors were out of phase during this process would be 100 times greater than the extent to which the transmitting wheel and valve wheel would be out of phase. If we assume 10 degrees change in phase of the motor shafts, the transmitting and valve wheel would be only 1/10 degree out of phase which, for all practical purposes, is negligible.

The mechanisms are made usually to transmit from 150 to 200 foot

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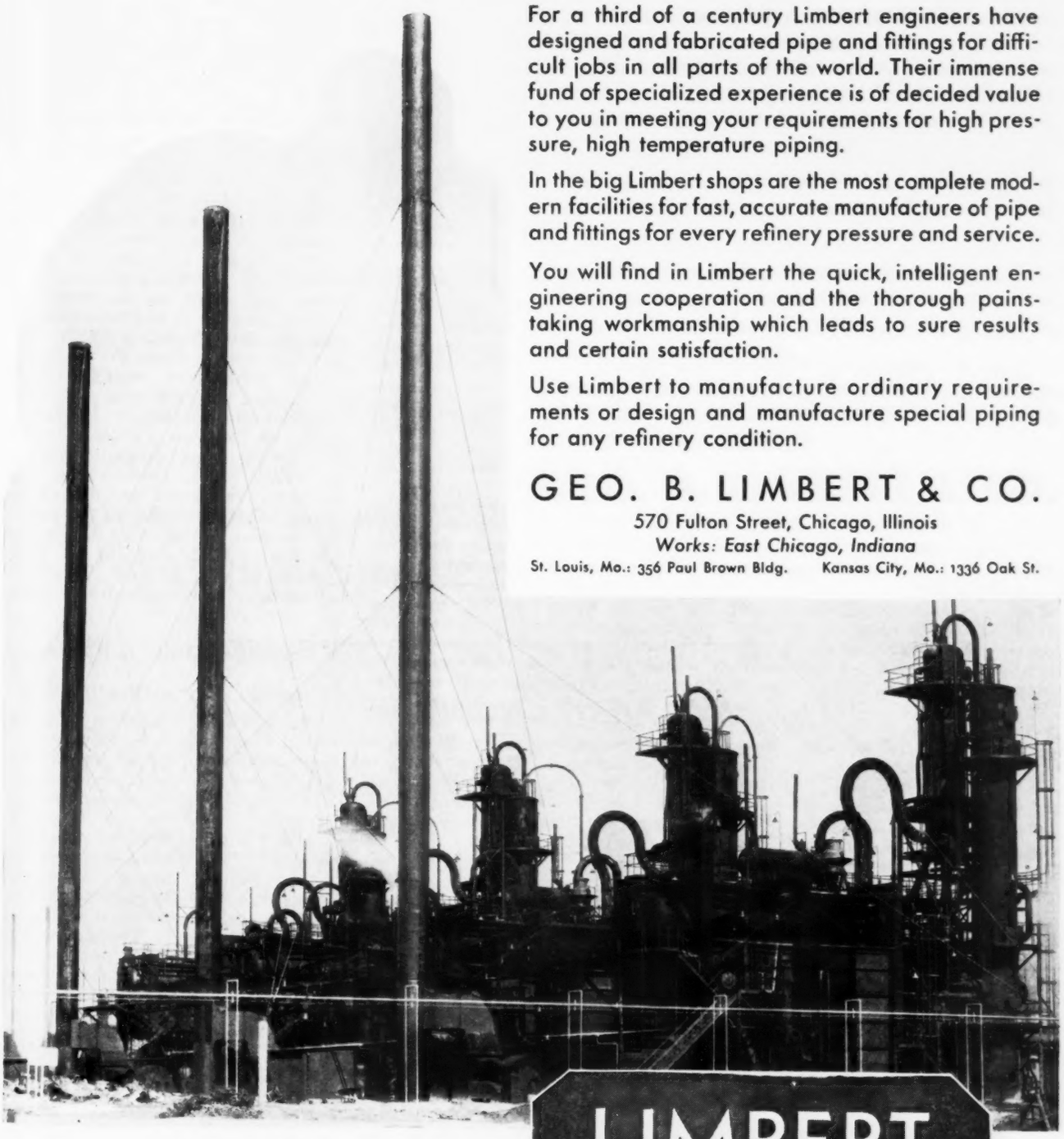

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Fig. 4—Control room in which remote control device has been used extensively

pounds which appears to be ample to turn any valve mechanism. They can also be made to operate in any ratio desired to obtain close control, thus it would be possible to have, by changing the gear ratio, four turns of the transmitting wheel to one turn of the valve in the event a close regulation is desired and a heavy valve is to be turned.

It will be evident that the application of remote control of this type to refinery equipment is almost unlimited. It is most usefully applied where controls are comparatively inaccessible and would require mechanical facilities for access and additional labor to operate without. For instance, one installation recently made comprises a distillation unit with a fractionating tower approximately 150 feet in height. This tower, which delivers a number of side streams, is controlled by changing the position of weirs at various levels in the tower.

It would be evidently impractical to have operators ascend the tower to make adjustment and it seems probable that if this were required, without making adequate provision for the circumstances, the operation might well suffer from lack of attention.

The installation on these units provides for a receiving motor which has a control point on the tower, and a transmitting mechanism located in the receiving house in proximity to the look boxes. Thus it is possible for the house man to trim the tower and change the quality of the side streams directly from the receiving house, which insures closer attention and less labor to operate the unit.

Again, in other installations for cracking, the control system has been applied to relief valves reducing the pressure from the reaction chamber into the bubble tower or from the bubble tower to the condenser and having this pressure release controlled by the operator on the board.

It is interesting to note in this connection that although automatic devices have been developed to maintain constant pressure, it is in many cases not desirable to do so. In the installation referred to, the cracking operation is primarily based on constant outlet temperature, other variables being subordinated to this factor.

When the still is operating properly and in balance, there is no tendency to increase or decrease the pressure on the system, therefore a setting of the pressure relief valve should under normal conditions be constant. If the pressure in the system rises, it is usually an indication that some other factor has disturbed the operation and if the operator at the control board notices this he will often remedy the condition without resetting the pressure relief valve. In this manner, the pressure is an indication of balance in the system which is extremely valuable.

If an automatic device is placed on the pressure relief line or the pressure is released by another operator independently of the control board, this indication never appears, since the valve will simply be reset with changes in pressure. The result of operating in this manner would be that the still can become unbalanced and continue to operate under this condition for some time before it is noticed by other indications and then a longer period of readjustment is required to correct the situation. In other words, when the pressure relief is controlled by the same operator who controls other portions of the apparatus he has an opportunity to judge whether the pressure valve must be reset or whether other conditions must be corrected. To remove this option makes the operation less efficient.

From the point of view of design, the remote control enables considerable saving in piping and in many cases removes the necessity of platforms and structural work to operate certain valves. It furthermore gives greater liberty in the design of the units as it does not force the position of the control panel in any particular locality but enables it to be placed where it is in the least danger from fire hazard and away from dust and dirt caused by cleaning.

The mechanism is safeguarded by the fact that the motors do not rotate when energized by the current and respond only to hand motion. In the event the current fails, the valve would remain in whatever setting it happens to be placed. There is no danger of overloading or of breakage since the power transmitted is merely that applied to the transmitting wheel.

Any resistance or reaction on the receiving end is, of course, felt on the transmitter so that if the valve were jammed or its stuffing box too tight this resistance would be felt in transmitting the motion. In other words, the man operating the remote control can actually feel what he is doing and obtain an immediate and natural reaction to any adjustment he makes. The advantages of this feature in refinery work are obvious.

The mechanisms were originally constructed to take care of special conditions in the design of cracking units but in view of their success and the apparent general usefulness in refinery work, provision has been made to commercialize the device. These will be available on the market in the near future and supplied by the Brown Instrument Co. of Philadelphia to suit a great variety of applications found in refinery design.

Specification Changes Are Recommended

CLEVELAND, April 3.—Committee D-2 on petroleum products of the American Society for Testing Materials, voted at a meeting at Detroit, March 18, to recommend adoption of the Reid method for the determination of the vapor pressure of natural gasoline. This method was proposed by the Natural Gasoline Association of America and has been adopted by the Interstate Commerce Commission. A new test method for determining crank case dilution was proposed.

Minor changes were recommended in tentative test methods for distillation of crude, hydrometer testing, precipitation number of lubes, sampling, and the lamp method for testing for sulfur in motor fuels, naphthas and illuminating oils.

Minor changes also were suggested in standard test methods for burning qualities of kerosene, mineral seal oil and railway long time burning oil; Conradson carbon residue test; cloud and pour point test; distillation method for natural gasoline and refinery light oils; and the test for water and sediment by centrifuge.

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Chicago, Illinois

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New Refining Patents

Combined Distillation and Cracking. U. S. P. 1,748,201, Feb. 25, 1930, G. A. Benhoff.

THIS invention provides a system, and arrangement of apparatus, whereby distillation, cracking, condensation and blending of condensates to give distillates of specific properties may be carried on in one continuous sequence of controlled operations, with minimum loss of material and heat and with maximum efficiency. This makes it possible, for example, by a prescribed method of liquid and vapor phase blending of the straight run and cracked fractions to obtain final products which meet commercial specifications without further treatment.

As an additional economy, provision is made for removing the free carbon formed in the endothermic reaction, holding it in liquid suspension and withdrawing it for use as fuel. The high thermal value of this carbon makes it an excellent source for the heat which must be supplied to the endothermic (cracking) reaction.

A sequence of operations is specified, in which an important feature is that the residue oil from the straight run distillation is blended with certain condensates, selected from the vaporized fractions both from distillation and from cracking, and is returned to the cracking zone for further treatment. By this means the yield of desirable products is increased, and the residue from the cracking zone is cleaner and more suitable for further treatment than otherwise.

The apparatus is so arranged as to permit utilization of the waste heat of the combustion gases by transferring it to the oil being treated. The entire operation is effected in a closed circuit, which gives further heat economy in that distillation losses are avoided. This, together with the fact that distillates are not cooled until suitably blended and prepared for commercial use, greatly lessens operating costs.

The products of the process as specified are gasoline, naphtha, blending naphtha, kerosene, gas oil, paraffin distillate, fuel oil and residue bottoms. Preferred arrangements of topping stills, fractionating towers, cracking stills, evaporators, heat exchangers and other parts of the apparatus are shown in drawings.

* * *

Purifying Cracked Gasoline. U. S. P. 1,749,240, March 4, 1930, John C. Black, Assignor to Richfield Oil Co. of California.

AN IMPROVED procedure has been developed for purifying cracked gasoline by removal of its sulfur compounds and resin or gum forming components. The new process is continuous, in that the cracked distillate passes continuously from one step in the procedure to the next.

A major feature of the invention is that the gasoline, after a preliminary washing with aqueous caustic soda, is heated with a suspension of manganese dioxide (or a like oxidizing agent) in caustic soda solution, to make the oil sweet to the doctor test. It is then heated under pressure with a very finely divided adsorbent clay to polymerize the unstable hydrocarbons, and distilled to separate the purified gasoline from the polymerization products.

This treatment is designed to yield a pure, stable gasoline by removing hydrogen sulfide and other sulfur compounds (including mercaptans) and unstable hydrocarbons such as olefines and diolefines. Apparatus is specified by means of which the advantage of continuous operation is attained.

* * *

Vapor Phase Cracking. U. S. P. 1,749,521, March 4, 1930, Cary R. Wagner, Assignor to Gyro Process Co.

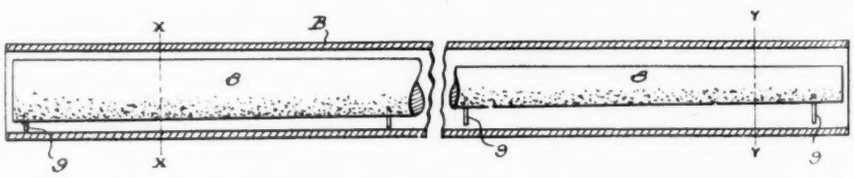
CONTACT catalysis and high temperature have been combined as major features of a new procedure for vapor phase conversion of heavy oils into lighter (gasoline) fractions. The combination is made effective by means of a vertical tubular converter in which the oil vapor is progressively heated, and is discharged at a temperature of 1000 F. or higher.

One of the principal features in which this invention is an advance over other catalytic vapor phase cracking methods is in the control of velocity of the vapor flow through the converter. This control is based on the discovery that carbon deposition is lessened if the ingoing velocity is relatively greater than the discharge velocity of the vapor. The greater velocity of the incoming vapor shortens the time required for heating to the converter temperature, by improving the heat transfer efficiency. With the shorter heating period, there is less coking and carbon deposition.

Of the several possible ways of increasing inlet velocity, one of the best is to restrict the cross sectional area of the inlet as compared with the outlet. A simple and effective form of converter for obtaining this effect is a tube of uniform diameter, containing a catalyst core which tapers somewhat toward the top. Thus the annular space around the core is smaller at the bottom, where the vapor enters, than at the top; and the rate of flow of the vapor is correspondingly faster at the bottom.

By this means, oil vapor velocities of 4000 to 7000 feet per minute may be provided at the inlet of a converter in which the discharge velocity is 2000 to 4000 feet per minute. The catalyst core may be molded of concrete as a carrier for a catalyst such as ferrous oxide.

The drawing shows a section of a converter tube, in which 8 is the catalyst core, supported within the tube by wire legs 9. The lines x—x and y—y designate parts of the converter in which the diameter of the core is noticeably different. A cracking unit comprises a battery of these converter tubes, suitably arranged in a heater and fitted for withdrawal of the treated vapor for condensation of gasoline fractions.



What Is Petroleum? You Can Tell 'Em Now

NEW YORK, April 2.—A little booklet that will answer all the questions so often asked of oil companies and oil trade publications about petroleum has been published by the American Petroleum Institute, 250 Park Ave., New York.

It is entitled "What is Petroleum?" and endeavors to answer that question in non-technical language, interestingly and thoroughly. These booklets are suitable for distribution to stockholders, employes, and customers generally and to dealers and motorists at service stations. They can be had in various lots for the cost of printing.

A second booklet in this series will be published shortly, to be devoted to petroleum in legend, in history and today, according to Leonard M. Fanning director of public relations for the Institute.

ADVERTISING PAGES REMOVED

Modern Refining—Science and Practice

By Colonel George A Burrell*

Heat Exchange

Article 18

In this article Col. Burrell traces the development of heat exchangers. He discusses heat transfer concepts showing the desirability of high velocities. Methods are given for calculating K, arriving at exchanger surface requirements and for analyzing the efficiency of exchangers. Recent studies in film concepts are explained.

WHEN continuous shell still batteries came into use in this country 30 years ago, followed by pipe still installations, heat transfer between residual oil and fresh charging stock began in earnest. Now with the extended use of tube stills and the vaporization of so much of the charging stock in columns there is little residue left in many cases for liquid heat exchange; hence result is made to heat exchangers for cooling the various cuts taken from the towers, such as partial condensers, kerosene and gas oil coolers and wax distillate and heavy lube coolers.

In such an installation, on a modern plant, it is possible and practical to heat the crude on its way to the still from 70 F. to 400 F. The value of such an installation may be appreciated if one considers that the products from a tower must be cooled in all cases and if the crude is not used, water will be, with a resulting increase in operating expense for water and also for fuel in the still.

In a plant handling 60,000 pounds of 42 gravity crude oil per hour the heat absorbed by the crude when heated from 70 to 400 F. will be 11,880,000 B.t.u. per hour, which at a cost of 50 cents per 1,000,000 B.t.u., would mean an annual saving of $51,934.00.

The average life of a modern heat exchange unit is three years, unless corrosion problems are encountered in which cases care should be used in the choice of the materials used in construction. The cost of the heat exchange units for such a plant should not exceed $25,000.00 or $50,000.00 in case of special alloy metals.

Development of Heat Exchangers

The first heat exchangers were of the coil and tank type; a coil of pipe placed in a tank. The oil in the coil had some velocity but that in the tank was comparatively stagnant. Next came double pipe heat exchangers. They survive today and possess merit, although they take up considerable space. High efficiencies can be obtained through high velocities. This frequently means high pump pressures. They can be made with a floating head so they can be easily taken apart and cleaned.

If not periodically cleaned, they, as well as all exchangers, rapidly lose their efficiency, if used on dirty oil. Many exchangers around refineries are working at 50 per cent or less of their efficiency because they are fouled up.

Next shell and tube exchangers were adopted; a shell filled with many tubes, as many as 1000. This type has passed through many modifications; filled with baffles of varying design, arranged so the oil makes two or three passes back and forth through it; or so part of the flow is perpendicular to the tubes. At first difficult to clean (like the early double pipe exchangers) they can now be quickly dismantled and the whole tube bundle removed. Floating heads relieve stresses due to unequal expansion because of the heat. The tubes are tightly expanded into a stationary sheet at one end and into a floating tube sheet at the other end. Thereby expansion and contraction of the tubes does not impose stresses on the shell.

In installations where great differences in temperature are encountered it is well to either divide the required surface into two or more units or provide divided floating heads and tube sheets so that one side of the tube sheet will not be under greater expansion strains than the other side.

An exchanger must be chosen for the work it is to perform; whether on light or heavy oils, on corrosive oils, on clean oils, and whether high pressures, and hence high pumping costs, will be necessary to get high velocities. The cost of the installation must be considered and replacement costs, ease of cleaning, soundness of construction, etc.

Heat Transfer Concepts

Modern concepts of heat transfer between fluids take into account films of fluid, say oil, next the walls of the interstices through which the oil flows. This film of oil is in relatively slow motion as compared to the oil in the center of the tube. Heat flows through it less readily because of its

*Consulting Chemical Engineer, Pittsburgh, Pa.

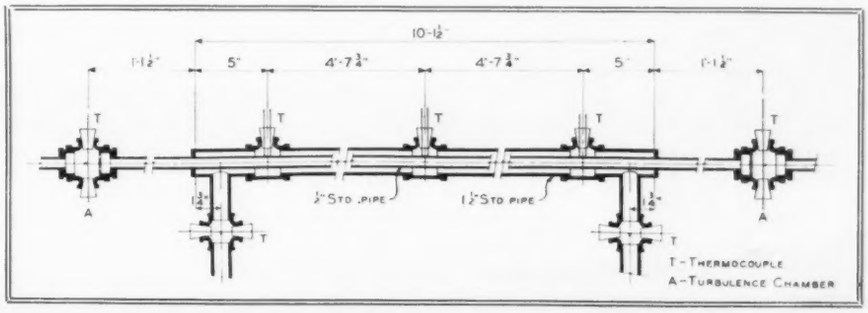
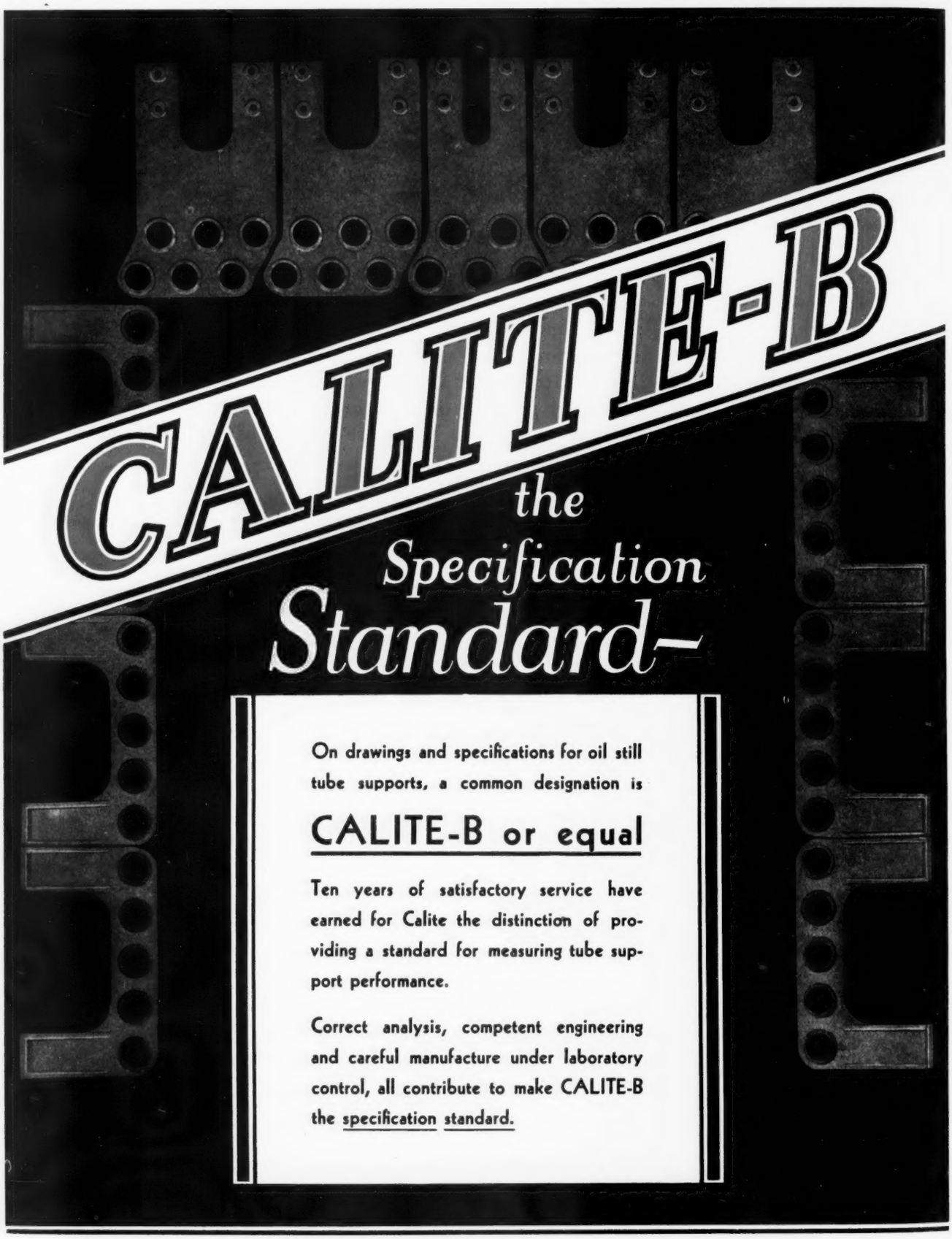


Fig. 1—Heat Exchanger (Morris and Whitman)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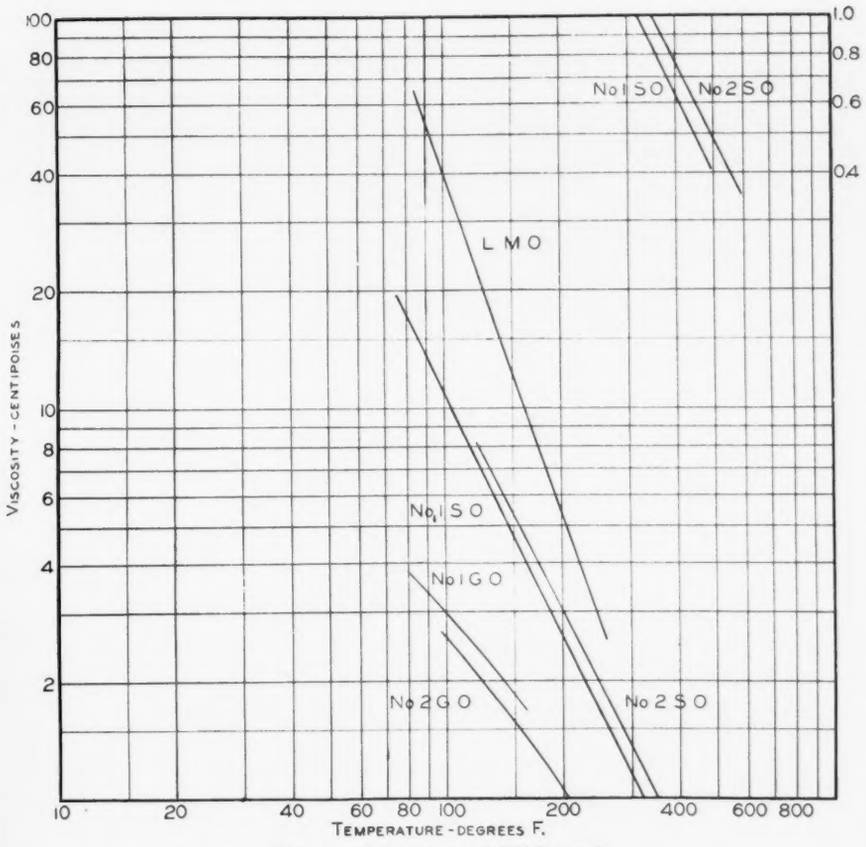


Fig. 2—(Morris and Whitman)

slow motion, and chiefly by conduction. Convection currents are relatively absent, hence this important medium of heat transference is largely lacking.

Heat flowing from a mass of oil on one side of a metal wall will travel relatively fast through the inner portion of the oil streams, then slow up as it encounters films of more or less stationary oil next the metal wall, then flow easily through the metal wall, next slow up as it meets a film of oil on the other side of the wall, and lastly flow into the moving oil next the film.

The thickness of these slow moving films will depend principally upon the velocity and viscosity of the oil. For high velocities they become relatively thin and thus there is obtained good heat transfer. For low velocities they become so thick as to largely destroy the efficiency of heat exchange apparatus. The rate of flow will vary inversely as the film thickness.

High velocities, as already stated, largely destroy these inhibiting films. High velocities mean turbulent motion. It has long been demonstrated that fluids pass from undesirable so-called stream line flow where heat transference is low and chiefly by means of conduction, rather suddenly to desirable turbulent motion, where heat transference is good, and chiefly by convection.

This change to turbulent flow is sometimes termed the critical velocity and its value has been found to be inversely proportional to the diameter of the tube through which the fluid is flowing and directly proportional to the viscosity of the fluid. But for the best heat exchange this critical velocity has to be exceeded for a wide margin.

Flow in Heat Exchangers

Present day heat exchangers frequently embody so-called cross flow along with countercurrent flow; within the heat exchanger the oil may travel at right or left angles to its normal flow by means of baffles appropriately placed. Thus for a given capacity heat exchangers are made into smaller units and take up less space. This is seldom done, however, in the case of vapor heat exchangers for cross baffles increase the velocity, which increases the pressure drop, and thus too much back pressure may be put on the column.

It is common practice to use three heat exchange sections in a vapor condenser, passing crude oil through the two hot sections and water through the final section to secure a low outlet temperature and condensation that is as complete as possible.

Exchangers are sometimes built in pairs in parallel so one can be cut out for cleaning, or repairing, operating the other the meanwhile. Other practice is to operate three of them in parallel. When one of them is down very nearly the same heat exchange can be secured by throwing the entire burden on the other two, thus increasing the velocity.

Overall Coefficients

Most heat exchange calculations are based on the overall coefficient of heat transfer. The petroleum industry seems to prefer the symbol "K," while other industries use "H." The symbol "U" was originated by the chemical engineers of the Massachusetts Institute of Technology. "K" is the number of B.t.u.'s transferred per hour per square foot of surface per degree of mean temperature difference. This overall coefficient is made up of several factors.

"K" is dependent upon the velocities of the liquids on both sides of the heat transferring surface, on the viscosity and gravity of the oil, and upon the specific type of exchanger employed, as well as cleanliness of the exchanger and upon some other less important factors.

The writer has noted that for so-called double pipe exchangers, wherein petroleum oils are used, it varies in actual practice, good and bad, from a very low figure, as low as 5 B.t.u. for heavy oils and low velocities in a poor exchanger, up to 125 B.t.u.'s for light non-viscous oils, at high velocities and excellent exchanger construction. One figure represents poor efficiency, and the other higher than in usual practice and probably the upper limit in modern efficient shell and tube heat exchanger construction for light oils.

A value of 30 to 40 is a fair one to use for oils of the gas oil type in double pipe exchangers. It is higher in shell and tube exchangers because of a better disposition of the surfaces; probably 50 to 60 B.t.u.'s in oil to oil heat exchangers where gas oil is employed, 75 to 80 B.t.u.'s when used to condense gasoline using water as the cooling medium, and 100 or more B.t.u.'s for oil to water heat exchange in the coolers of a natural gasoline plant.

When crude oil is heated by means of residuum in a shell and tube exchanger a "K" of 30 to 40 B.t.u.'s is sometimes used by manufacturers of this type of equipment. The above values vary much among different equipment makers.

The method arriving at the required exchanger surface follows:

B.t.u.'s=(gallons of oil per hour) (weight in pounds per gallon) (specific heat of oil) (temperature reduction desired)

M.T.D.=the mean temperature difference in a contra flow unit. This is determined as follows:

T=temperature of hot oil entering exchanger.

T_1=temperature of hot oil leaving exchanger.

t=temperature cold oil entering exchanger.

t_1=temperature cold oil leaving exchanger.

To obtain the mean temperature difference, subtract t_1 from T and t

from T_1 arriving at a difference at both ends of the exchanger thus:

T	T_1
t_1	T
diff.	diff.

Add the difference on both sides of the exchanger together and divide by 2, to arrive at the arithmetical mean. This, however, is not the correct mean temperature difference. The difference is not always the same in all parts of the surfaces. It keeps changing. Hence the logarithmic mean must be determined. This is expressed by the formula:

$$\text{M.T.D.} = \frac{\theta_a - \theta_e}{\log_e \frac{\theta_a}{\theta_e}}$$

where,

M.T.D.=mean temperature difference

θ_a = maximum temperature difference

θ_e=minimum temperature difference

Hausbrand[1] gives a handy table, corrected for some numerical errors by Badger[2] for quickly determining the mean temperature difference. In any individual case, in order to find the correct mean temperature difference, it is only necessary to determine $\frac{\theta_e}{\theta_a}$ from the result find its corresponding value in column 2 and then multiply θ_a by this value.

$\frac{\theta_e}{\theta_a}$	2	$\frac{\theta_e}{\theta_a}$	2
0.0025	0.166	.20	.499
.0050	.188	.21	.509
.01	.215	.22	.518
.02	.251	.23	.526
.03	.277	.24	.535
.04	.297	.25	.544
.05	.316	a.30	583
.06	.334	.35	.620
.07	.350	.40	,655
.08	.365	.45	.690
.09	.379	.50	.724
.10	.392	.55	.756
.11	.405	.60	.786
.12	.417	b.65	.815
.13	.429	.70	.843
.14	.440	.75	.870
.15	.450	.80	.898
.16	.460	.85	.925
.17	.469	.90	.950
.18	.479	.95	.975
.19	.489	1.00	1.000

a For all values above this the arithmetical mean will be 10 per cent in error.

b For all values below this the arithmetical mean will be in error by less than 1 per cent.

As regards this logarithmic mean and complication of the calculation by its inclusion it can be stated that with the large changes in temperature which occur in heat exchangers, it is entirely possible for the arithmetical temperature drop to be 30 per cent in error. Badger finds that if the arithmetical mean is used as the mean temperature drop it will be in error by 10 per cent or more when $\frac{\theta_a}{\theta_e}$ is over 3.2 and by 1 per cent or more when $\frac{\theta_a}{\theta_e}$ is over 1.5.

[1]E. Hausbrand, Evaporating, Condensing and Cooling Apparatus, 1919, p.7.

[2]W. L. Badger, Heat Transfer and Evaporation (1926), p.23.

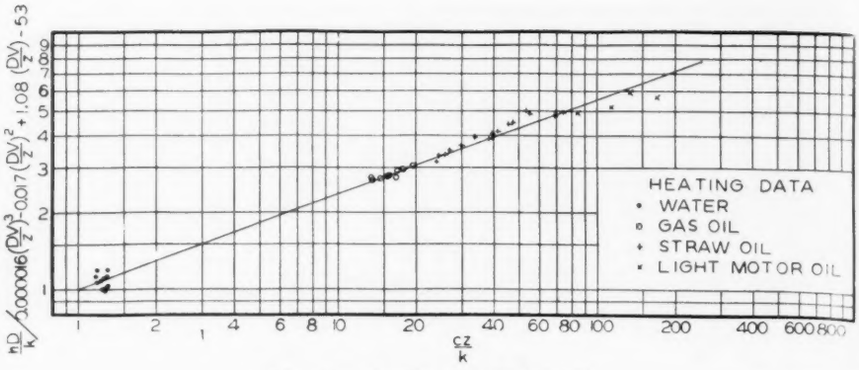


Fig. 3—(Morris and Whitman)

To complete the heat exchange calculation one proceeds as follows:

$$\frac{\text{B.t.u.'s to be removed}}{\text{K (M.T.D.)}} = \text{square feet of surface required.}$$

This is the calculation usually employed in calculating heat exchange surfaces. It assumes a certain value of "K." This unfortunately varies with many factors, but it is the case that the same type of heat exchanger, same velocities and same oil are used in many plants. The "K" becomes known for a certain heat transfer condition, considered satisfactory, in which event additional heat exchangers for different quantities of the same oil and different temperatures can be accurately calculated. When a viscosity correction is employed surfaces for oils of different viscosities can be calculated.

A more modern method of determining the value of K, than the one already given, is used by some oil companies and equipment manufacturers. It considers gravity, viscosity, velocity, tube size and temperature. Thus two additional factors are accounted for; gravity and viscosity, as follows:

$$K_1 = \frac{1.88}{d^{0.2}} \left(\frac{Vm}{Z} \right) 0.8$$

where $K_1 = K$ on the inside of tube.

$d^{0.2}$ = internal diameter raised to 2/10 power

V_m = Mass velocity = lbs. of oil × velocity in ft. per sec.

Z = Relative viscosity — (to water)

An example of the use of this formula follows:

Cold Oil	Saybolt Viscosity	Hot Oil	Saybolt Viscosity
t_1=127°F.	42.5	t_1=235°F	30.9
t_0—190°E.	33.8	t_0—167°F.	36.5

Saybolt Viscosity	Kinematic X	Sp. Gr.	Abs. Vis. Centipoises
30.9	1.05	.87	.9135
33.8	1.80	.87	1.566
36.5	2.90	.87	2.523
42.5	4.50	.87	3.915

Assume that the cold oil has a velocity through the tubes of 2½ feet per sec.

$V_m = 2.5 \ (62.5 \times .87) = 135.9275$

$Z = 190° = 1.566$

$Z = 127° = 3.915$

$$\frac{5.481}{2} = 2.7405 \text{ — relative mean velocity}$$

Assume that the tubes have a diameter of .584″ inside. Then the inside K becomes,

$$K \text{ inside} = \left(\frac{1.88}{.584^2} \right) \times \left(\frac{135.9275^{.8}}{2.7405} \right)$$

$$= \frac{1.88}{.898} \times 49.6^{.8} = 2.1 \times 22.174 = 47.69$$

K inside = 47.69

K_o for the outside of the tubes is similarly calculated. Assume ¾-inch tubes, 15/10-inch centers, and a mean bridge wall of ⅜ inch. Also that the hot oil has a velocity of 2½ feet per second.

$$\text{Abs. viscosity} = 235° = \frac{\text{abs. vis.}}{2.523} = .9135$$

$$167° = \frac{3.4365}{2} = 1.71825 = Z$$

$V_m = 2.5 \times 62.5 \times .87 = 135.9275$

$Z = 1.71825$

$$K_o = \left(\frac{1.88}{(.375)^{0.2}} \right) \times \left(\frac{135.9275^{0.8}}{1.71825} \right)$$

$$= \frac{1.88}{.82} \times 79.11^{0.8} = 2.293 \times 33 = 75.669$$

Then with efficient cross baffles to secure turbulence, take 2.5 times 75.669 = 189.15 for the true K_o.

The overall K becomes,

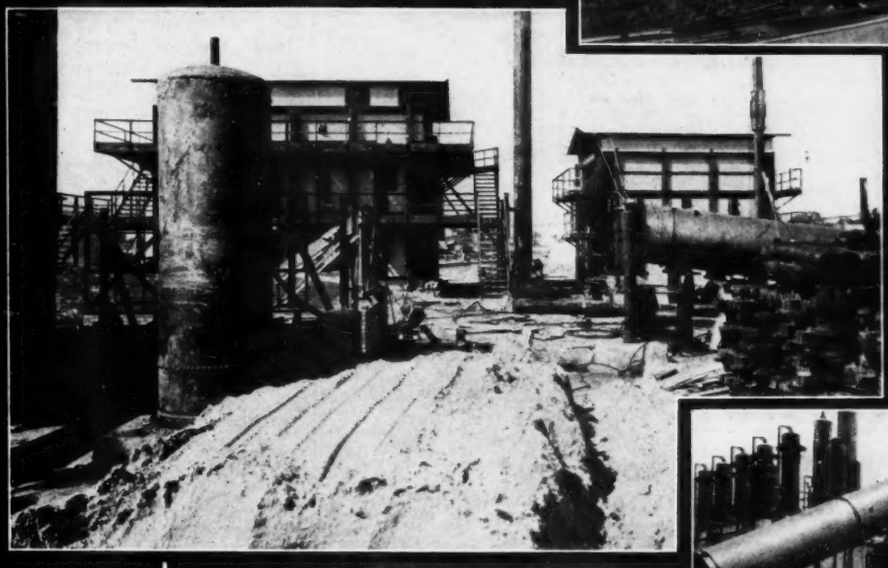
$$\frac{1}{\frac{1}{189.15} + \frac{1}{47.69}} = 39.5$$

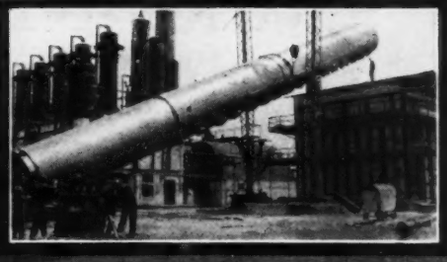
This value, 39.5, is based on units in average condition; not dirty or new ones.

Pumping Costs

Pumping costs are sometimes important. Assume that a pump pressure of 50 pounds per square inch is required to force oil through a double pipe exchanger, and 15 pounds through a tubular one, to get equal

ALWAYS ACTIVE!





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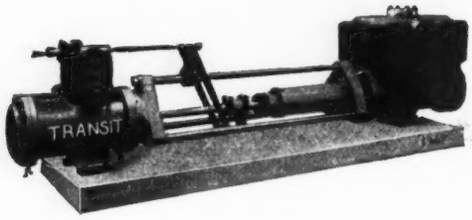

Pumping out pumps are used to remove the tar and residual from various types of oil stills. This can be, and oftentimes is, one of the meanest jobs around a refinery. It requires a special pump to do this work successfully.

TRANSIT Block Valve Pumps have large rectangular valves as large as your feet, but no guards, no stems, no springs, nor separate seats to loosen by reason of the expansion of the fluid end from the hot tar. The valve seats are integral with the fluid cylinder casting. There is no trouble from expansion regardless of the heat of the fluid pumped.

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transfer rates. This is a difference of 25 pounds. If one assumes that 6500 gallons of oil per hour is being circulated the saving may be $300 to $500 per year, depending upon fuel costs, by using the lower pressure.

Analysis of Exchanger Efficiency

Analysis of a double pipe heat exchanger follows:

The exchanger had an area of 1224 square feet and passed 75,000 gallons of oil per 24 hours. Hence the exchanger area in square feet per gallon of oil per hour was 0.39. The lineal feet of travel was 1512. Hot oil from the still entered at 284 F., and left at 93 F. The cold oil entered at 57 and left at 232 F. The exchanger consisted of 3-inch pipe inside of 5-inch pipe, and was 63 feet long, 6 pipes high, and had four stands with one in parallel and four in series.

The M.T.D. was 43.8, and K was 38.2. The average oil velocity was 116 feet per minute. The B.t.u.'s. removed per hour were 2,047,500. The heating efficiency becomes 77 per cent and the cooling efficiency 84 per cent. The former can be calculated by dividing the total possible theoretical heat rise (227 F.) into the actual heat rise (175 F.) and multiplying by 100. The cooling efficiency is calculated by dividing theoretical cooling effect (227 F.) into the actual cooling effect (191 F.) and multiplying by 100. These calculations neglect gasoline in the cold oil; about five per cent.

Per Cent of Heat Saving

The last increment of heat is the most expensive to save, hence exchangers seldom save more than 80 per cent of the total heat available to be saved. The writer is aware of one case where, with a K of 47, passing 25,000 gallons of gas oil per hour, at a velocity of 120 feet per minute, that 70 per cent of the heat was saved with 5600 square feet of surface. This is 0.22 square feet per gallon per hour.

To save 90 per cent of the heat needed 0.84 square feet per gallon per hour, or a total of 21,000 square feet of surface. The total surface adopted was 0.40 square feet per gallon per hour, or 10.800 square feet of surface, 15,700,000 B.t.u.'s. were transferred. This is equal to 470 boiler horsepower, which at $60.00 per boiler horsepower equals $28,000.00 saved per year. The exchanger cost $30,000.00 installed. This installation made in 1922 has been paying a 70 per cent dividend each year to the owners.

Calculations Involving Film Concepts

More recent studies of heat exchange equipment have resulted in the elaboration of earlier theories so that attempts are now made to resolve the overall coefficient K into several factors that make it up. As already stated there exists next to the walls

of the transferring surface more or less stagnant films of liquid ranging from zero velocity up. These films act as powerful barriers to heat flow. The magnitude of the barrier is illustrated by W. L. Badger. The thermal conductivity of copper in B.t.u. per square foot per degree F. per hour is 220 to 210 F. Hence a plate of copper 0.10-inch thick with a temperature drop of 1 degree F. between the two faces should transfer,

$$220 \frac{12}{010} = 26{,}400 \text{ B.t.u. per hour.}$$

But in practice, assuming steam on one side and boiling water on the other side, one will find about 300-500 B.t.u. passing through one square foot per hour degree F. If one side of the plate is in contact with a gas the heat transferred will be 1/100 of this value.

McAdams, Lewis, Morris, Whitman and others of the Massachusetts Institute of Technology, or formerly of that institution, have done much to advance our knowledge of film calculations. The most recent work on petroleum is that of Morris and Whitman[3]. They determined film coefficients for three petroleum oils and for water flowing through a tube of a double pipe heat exchanger. The experiments covered both heating with steam and cooling with water under similar conditions. The flow was in turbulent or semi-turbulent regions.

Linear velocities varied from 1 to 20 feet per second, viscosity ran from 0.5 to 55 centipoises and the heat transfer coefficients on oil covered a range from 10 to 700 B.t.u. per hour per square foot per degree Fahrenheit. The results were correlated by means of the Nusselt equation.

$$\frac{hD}{K} = \Phi\frac{(DV)}{(z)} \quad \Psi\frac{(cz)}{(k)}$$

Fig. 3 shows $\Psi \frac{(cz)}{(k)}$ plotted against $\frac{cz}{k}$ and is to be used for both heating and cooling.

Fig. 4 shows $\Phi \frac{(DV)}{(z)}$ vs $\frac{DV}{z}$ for heating runs.

Fig. 5 shows $\Phi \frac{(DV)}{(z)}$ vs $\frac{DV}{z}$ for cooling runs. The line drawn gives values of $\Phi \frac{(DV)}{(z)}$ which are 75 per cent of these given by the heating line of Fig. 4.

All properties of the liquid were taken at the temperature of the main body of the liquid.

[3]Before Pet. Div. Am. Chem. Soc., Detroit, Mich., Sept. 1927.

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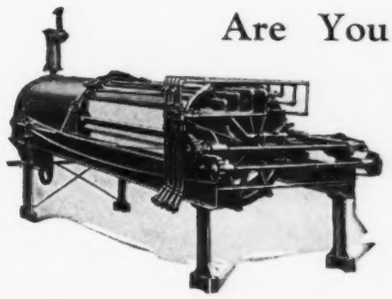

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The symbols used had the following meanings:

D = diameter of pipe in inches.

h = film coefficient of heat transfer in B.t.u. per hour, per square ft. per degree Fahrenheit.

K = thermal conductivity in B.t.u. per hour per sq. ft. per degree Fahrenheit per ft. of thickness.

Q/Θ = total heat transferred in B.t.u. per hour.

P = density of liquid in lb. per cu. ft.

u = average velocity in ft. per sec.

V = uP = mass velocity in lb. per sq. ft. per sec.

z = viscosity in centipoises.

A = area of internal heat transfer surface of pipe in sq. ft.

c = specific heat.

Δt = difference between the temperature of the body of the liquid and that of the internal surface of the pipe.

$$M = \frac{hD}{k}$$

$$N = \frac{Du}{z} = \frac{DV}{z}$$

$$P = \frac{cz}{k}$$

Φ and Ψ = functions to be determined by experiment.

Morris and Whitman illustrate the process of estimating h for a given set of conditions, as follows:

calculate $\frac{cz}{k}$ and $\frac{DV}{z}$. Read $\Psi \frac{(cz)}{k}$ and $\Phi \frac{(DV)}{z}$ from the plots. Then

$$\frac{hD}{k} = \Phi \frac{(DV)}{z} \Psi \frac{(cz)}{k}$$

and h is readily found.

For instance suppose a crude oil is being heated in a long 3-inch pipe. The oil is at 150 F. and at that temperature its density is 50 pounds per cubic foot, its viscosity 1.5 centipoises and its specific heat 0.51. It is flowing with an average lineal velocity of 2 feet per second. Then

$$\frac{DV}{z} = \frac{Dup}{z} = \frac{3.07 \times 2 \times 50}{1.5} = 205$$

$$\frac{CZ}{k} = \frac{0.51 \times 15}{0.078} = 9.8$$

	Heating Runs			Cooling Runs		
	High	Low	Ratio	High	Low	Ratio
Linear velocity, u	19.5	0.9	22	16.9	1.1	15
Viscosity, z	55	0.5	110	15.6	0.5	31
Temp. of liquid °F.	169	83	.....	512	115	....
$\frac{DV}{z}$	313	5.0	63	365	7.6	48
$\frac{CZ}{k}$	310	1.2	260	94	4.2	22
$\frac{hd}{k}$	4890	300	16	5590	110	51
h	1560	40	39	700	14	50
Total No. of runs	.....	56	.....	.....	62	....

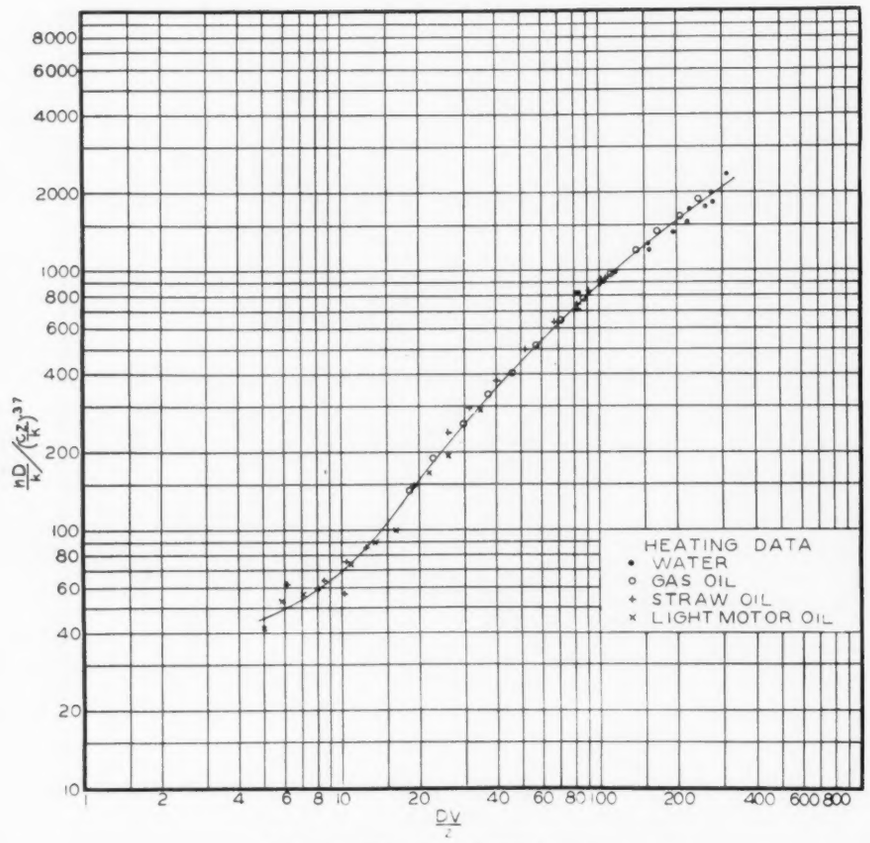

Fig. 4—(Morris and Whitman)

From Fig. 4, $\Phi \frac{(DV)}{z} = 1600$

From Fig. 3, $\Psi \frac{(CZ)}{k} = 2.3$

$$\frac{hD}{k} = \Phi \frac{(DV)}{z} \Psi \frac{(CZ)}{k} = 3700$$

$$h = \frac{3700 \times 0.078}{3.07} = 94$$

Knowing the quantity of heat exchanged, the temperatures of the inner pipe wall and of the body of the stream, the film coefficient can be calculated from the equation.

$$\frac{Q}{\Theta} = hA\,\Delta t$$

The range of the data used by Morris and Whitman follows:

Gravities and designations of the oils follow:

	°A.P.I.	Sp. Gr.
No. 1 Gas oil	36.8	0.841
No. 2 Gas oil	35.8	0.846
No. 1 Straw oil	29.4	0.879
No. 2 Straw oil	29.5	0.879
Light Motor oil	22.9	0.917

The writer has applied Morris and Whitman's data to find the heating surface necessary in a double pipe heat exchanger when 100 gallons of hot oil (of the gas oil type) at 250 F. enters the inner pipe of a standard 1¼-inch by 2-inch double pipe heat exchanger (made of steel) and leaves at 120 F., 105.3 gallons per minute or rich oil containing 5 per cent gasoline enter the annular space at 70 F., flowing in a direction opposite to the warmer oil. The 2-inch pipe is lagged and oil velocity in the inner pipe does not exceed 4 feet per second. The problem is to calculate the total linear feet of double pipe required, specifying the arrangement of same.

Calculations

One can assume the absorption oil to be Mineral Seal of 38 A.P.I. gravity and 44 seconds Saybolt Universal viscosity at 100 F.

Feed = 100 × 6.95 × 60 =
41,600 lbs./hr. lean oil
2,100 lbs./hr. gasoline

43,700 lbs./hr. rich oil

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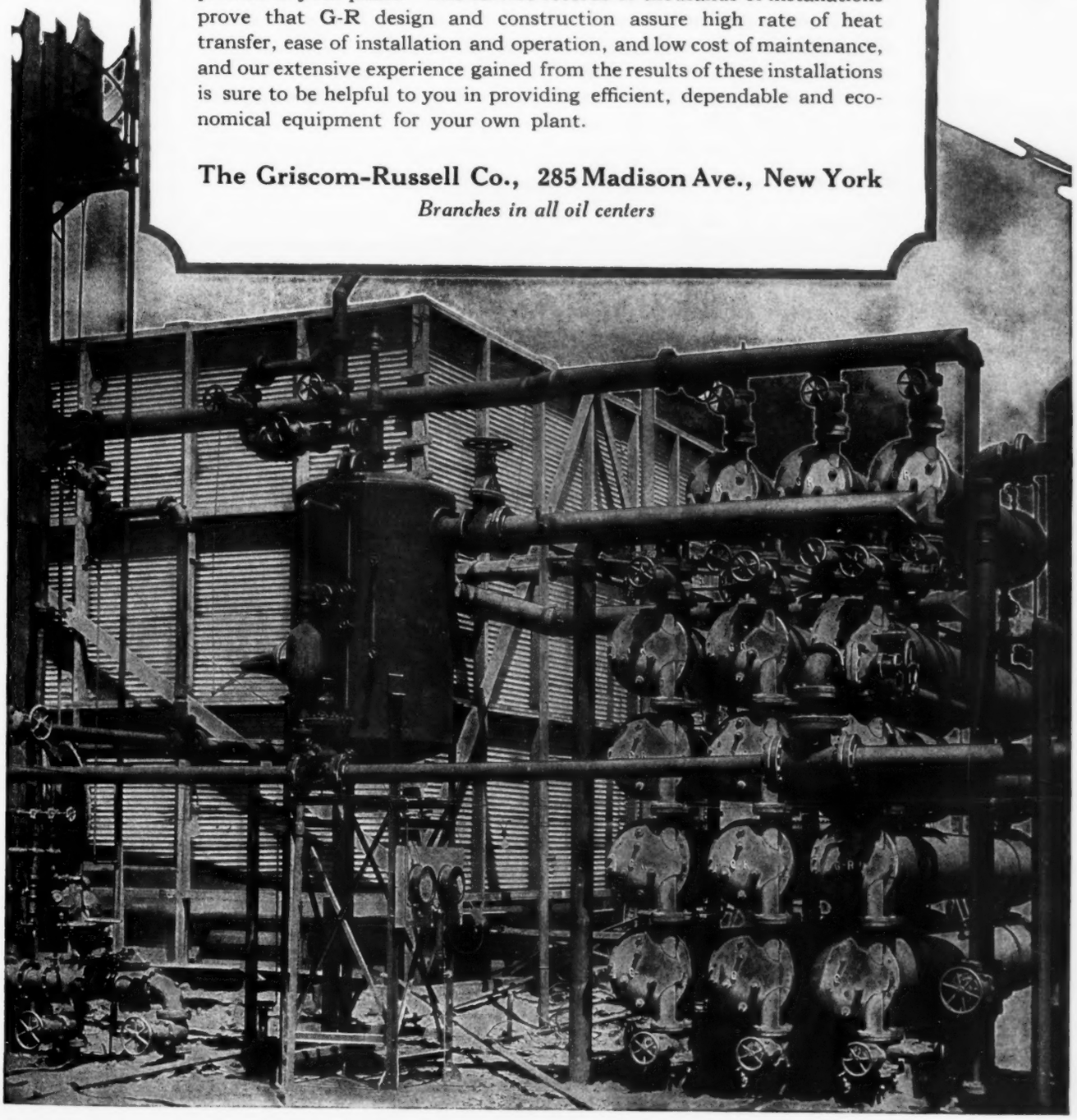

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$$\text{Specific gravity} \frac{60}{60} = 0.835$$

Average temperature lean oil = 185

Specific heat[4] =

$$\frac{(2.10 - .83)\ (670 + 185)}{2030} = 0.535$$

Heat exchanged = 41,600 (250—12) 0.535 = 2,900,000 B.t.u./hr.

Average temperature rich oil = 135 (approx.)

Specific heat =

$$\frac{(2.10 - .83)\ (670 + 135)}{2030} = 0.504$$

Rise in temperature =

$$\frac{2{,}900{,}000}{43{,}700 \times 0.504} = 132^\circ \text{ F.}$$

Final temperature rich oil = 202° F.

$\Delta t_1 = 250 - 202 = 48^\circ$ F.

$\Delta t_2 = 120 - 70 = 50^\circ$ F.

Ave. $t = 49^\circ$ F.

Cross section 1¼-inch std. pipe =

$$\frac{(1.38)^2 \pi}{144 \times 4} = 0.0104 \text{ ft.}^2$$

For maximum velocity of 4 ft./sec., the number of pipes in parallel =

$$\frac{100}{60 \times 7.48 \times 4 \times 0.0104} = 5.35$$

Use 6 in parallel

Velocity (cold) =

$$\frac{100}{60 \times 7.48 \times 6 \times 0.0104} = 3.57 \text{ ft./sec.}$$

Cross section annular space =

$$\frac{\pi}{144 \times 4} ((2.067)^2 - (1.66)^2) = 0.0083 \text{ ft.}^2$$

Vel. =

$$\frac{105.3}{60 \times 7.48 \times 6 \times 0.0083} = 4.71 \text{ ft./sec.}$$

Heat Transfer Coefficients

For the lean oil:

$D = 1.38''$

$V = 3.57 \times 6.95 \times 7.48 - 185$ lbs./sec./ft.²

$z_{185^\circ} = 1.70$ centipoises

$c = 0.535$

$k = 0.078$

$\frac{DV}{z} = 150$

$\Phi \frac{DV}{z} = 930$ (from the cooling curve)

$\frac{cz}{k} = 11.7$

$4 \frac{(cz)}{k} = 2.50$

$\frac{hD}{k} = 930 \times 2.50 = 2320$

$h = 131$ B.t.u./hr./ft.²/°F.

For the rich oil:

D = 0.41" (for the diameter use

[4]Specific heats from data in J. I. E. C., August, 1926.

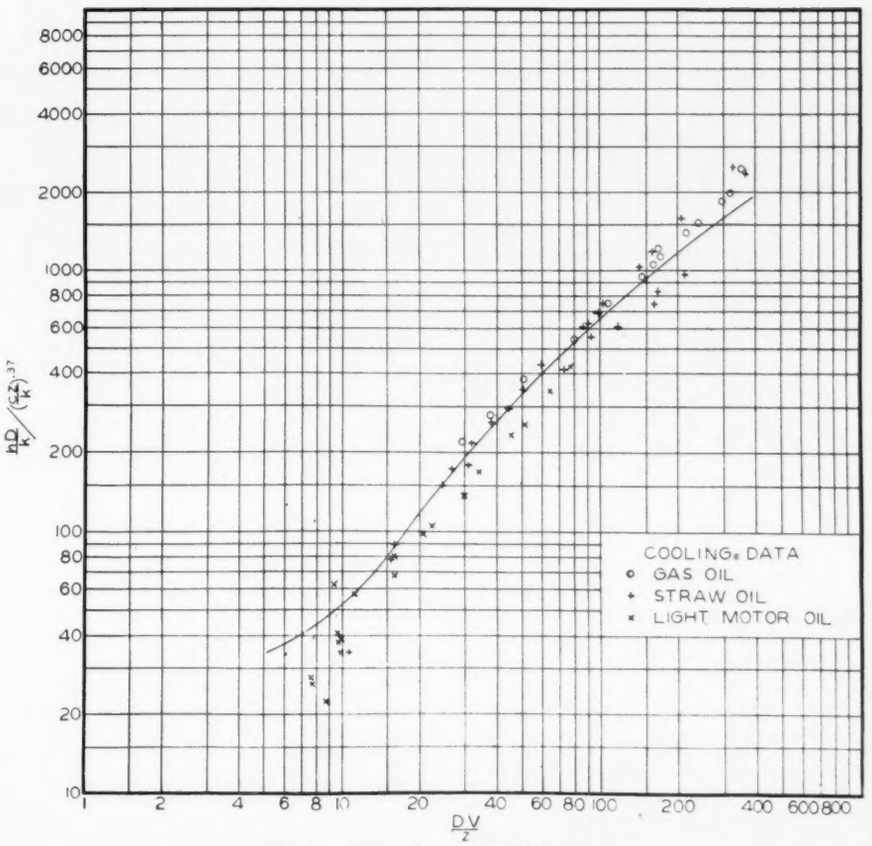

Fig. 5—(Morris and Whitman)

the diameter of that circue which has the same hydraulic radius as the section in question. For an annular space this is the difference between the internal diameter of the outer pipe and the external diameter of the inner).

$V = 4.71 \times 6.95 \times 7.48 = 245$

$z 135 = 2.85$

$c = 0.504$

$k = 0.078$

$\frac{DV}{z} = 35.2$

$\Phi \frac{(DV)}{x} = 310$ (from the heating curve)

$\frac{cz}{k} = 18.4$

$4\left(\frac{cz}{k}\right) = 2.95$

$\frac{hD}{k} = 310 \times 2.95 = 915$

$h = 174$ B.t.u./hr./ft.²/°F.

Using the familiar formula for heat flow through a series of resistances and giving k for steel the value, 25,

$$HA_{av} = \frac{1}{\frac{1}{h_1A_1} + \frac{L}{k\,A_{av}} + \frac{1}{h_2A_2}}$$

H, the overall coefficient = 70.6 B.t.u./hr./°F. ft.² average area

No correction has been made for end effects. In pipes as long, relative to their diameter, as these the effects would be small and uncertain, and the omission of the correction is on the safe side.

Total surface needed $= \frac{2{,}900{,}000}{49 \times 71} = 840$ ft.²

Number of lengths in series $= \frac{840}{6 \times 0.398 \times 19} = 18.7$

Use 114 lengths of pipe (2232 feet) 6 in parallel, 19 in series.

TULSA—Pure Oil Co. has relined the expansion chambers and dephlegmators on four Dubbs units in its Ardmore plant.

CHICAGO—William Plummer, who was formerly a research group leader in the Combustion Utilities Corp., Linden, N. J., subsidiary of the H. L. Doherty Co., has joined the research staff of the Standard Oil Co. (Indiana). Mr. Plummer will work with problems on gas utilization.

$$H \times 0.398 = \frac{1}{\frac{1}{131 \times 0.361} + \frac{0.14/12}{25 \times 0.398} + \frac{1}{174 \times 0.435}} = 28.1$$

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Pure Oil's 2,500,000 Gallon Terminal Anticipates Inland Water Traffic

By Roger B. Stafford
N. P. N. STAFF WRITER

Part 2

THE lubricating oil unloading rack parallels the light oil unloading rack and has capacity for five tank cars at one time. Unlike the light oils, the heavy oils are unloaded from the bottom of the cars. The lubes have a separate pump house from the light oils and the bulk storage in indoors and steam heated.

The lube unloading rack consists of five groups of six pipe lines each and steam plugs at each group of pipes. All lube pipes are in trenches in which are large steam lines to reduce the viscosity of the oil for handling in cold weather.

The heavy oil pump house is alongside the unloading rack. It has six 200-gallon-per-minute Viking rotary pumps, with direct drive from 7½ horsepower GE motors.

One line from each of the five groups of unloading pipes runs to the manifold for each pump and from the manifold to the storage tanks in the basement of the warehouse. Only oils of common characteristics or colors are permitted in any unloading system of pipe lines, pump and manifolds. For example, Tiolene motors oils use one system, Purol motors oils another, light cylinder oils, another, and dark cylinder oils stock another. There are six general groupings of the 39 oils for which the terminal has bulk storage. This method of handling prevent the contamination of one kind of oil by another kind.

In each unloading line is a 100-mesh screen strainer which traps any foreign matter that might have gotten into the oil in transit.

The oil storage tanks—39 of 10,000 gallons' capacity each—are set horizontally on concrete cradles to which they are strapped with heavy steel cables. This is another flood precaution.

On a cantilever shelf in the oil storage room is the most imposing battery of lube pumps, direct motor driven, this writer has ever seen. There are 39 of them, each driven with a 2 horsepower GE motor, and all are Viking rotaries. Some of the pumps are geared to 35 gallons per minute but those that pump the heavy lubes are geared down to 25 gallons per minute.

These pumps, each one connected with a compartment of one of the 39 tanks, pump oil direct to the barrel fillers on the first floor of the warehouse. Control is by switch at the barrel filler and the men who work at the fillers know whether one pump is operating by a red light that burns while the current is on.

THIS concluding article on the terminal of Pure Oil Co. on the Ohio river at Cincinnati describes how lubricating oils are handled, flood protection, reclaiming barrels, the steam plant, and garage. The first article on handling light oils and specialties, and the warehouse building was published in the April 2 issue of NATIONAL PETROLEUM NEWS.

Each pump handles only one grade of oil and the name and number of this grade is engraved on a brass plate at each control switch at the filler. The plates also show the pump and tank compartment numbers with which each filler is connected.

The fillers are all Pen-Flex and require attention only in starting the flow of oil. When a barrel or can is filled a float closes a valve in the nozzle. A 53-gallon drum can be filled with medium bodied motor oil in 1¾ minutes.

Each filler arm is on a ball joint which permits some freedom in the spotting of the barrels. Back of the ball joint in the line to the pumps is another valve which may be opened or closed with a lever. In the basement there is a gate valve in the line just after it leaves the pump. A by-pass is provided around each pump.

Filled barrels are weighed to determine the gallonage. They are stamped with the gallonage and may then be moved to storage on steel racks on the first floor of the warehouse or to the box car loading platform, or the stake truck loading platform. There are no provisions yet for tank truck loading of lubricating oils.

The terminal makes up a lot of pool car shipments for its own and agency bulk stations in territory around the Ohio valley. It receives its lubes, except greases, only in tank car lots and the stations that cannot handle tank car shipments or are not equipped for barreling, are served from Cincinnati as far as freight rates permit. These shipments mostly are assorted lots of motor and industrial oils and greases.

If the oils are to be stored in barrels the filled barrels are wheeled on two wheel trucks to one of the two portable Economy electric lifts on the first floor. These lifts raise the barrels to the tier of the rack on which they are to be stored.

The warehouse has about a dozen of the two-wheel barrel trucks and nine or ten small platform trucks for the moving of cased goods and 15 and 30-gallon drums and kegs.

Reclaiming Used Drums

Dirty drums are slid down two inclined chutes from the rear of the warehouse to the basement. There the bungs are set over steam jets and the insides cleaned of the larger accumulations of oil.

The drums are then partly filled with a cleansing solution or two or three gallons of kerosene, about 10 feet of log chain is put in, and the barrel put on a double rotation cleaning machine. The barrels are revolved on their long axis and end over end at the same time. This machine was made by the C. E. Farrington Co., Phoenixville, Pa.

After this operation the barrels are inspected on the inside by dropping an electric lamp through the bunk to see that no dirt is left inside.

The bung is then replaced and the outsides are given a bath in a cleansing compound in a vat. After that they are placed on a drying rack before they are brushed on the outside with a stiff wire brush in preparation for the painting by hand.

Reclaimed barrels are stored in the basement until they are wanted for

refilling. They are hoisted to the first floor filling department by an endless chain electric lift made by the Jeffrey Mfg. Co., Columbus, O.

Steam Plant

The terminal has three 75 horsepower Kewanee boilers only one of which is used for two weeks at a time. This makes a six-week cycle for the boilers, two weeks on duty, two weeks for cleaning, and two weeks in reserve for an emergency.

All steam is recondensed and returned to the boilers which are equipped with automatic water controls.

Radiators are used to heat the offices and pump houses and Ilg-Air heaters are suspended from the ceiling in the warehouse.

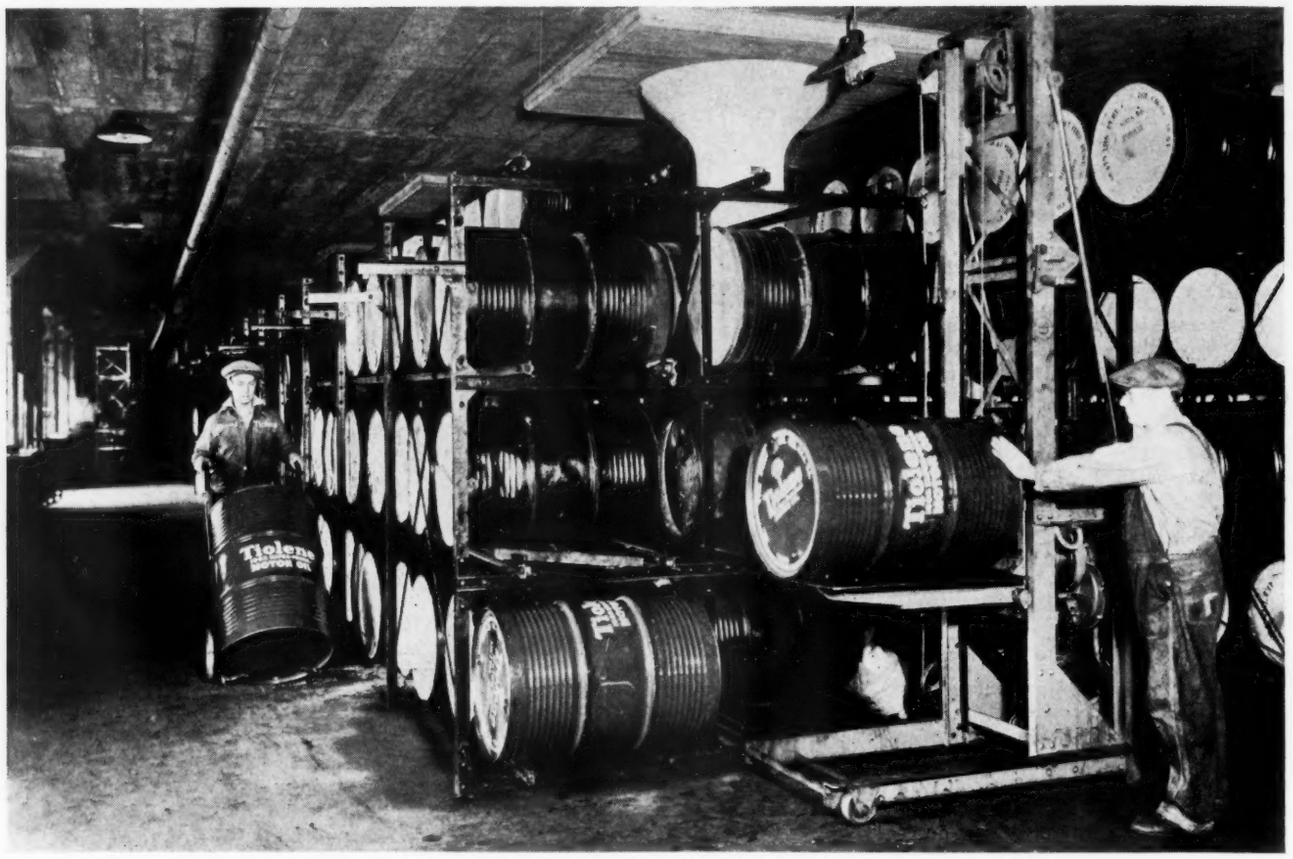
The boilers are coal fired and one man, a licensed stationary engineer, is in charge. Coal is dropped from hopper cars direct to the coal cellar. Ashes are put in iron cans and hoisted on a hand lift to the ground level.

Fire Protection

The terminal has an elaborate foamite system built in. There is a foamite pump house with stationary mixer at a safe distance from the tanks. At present it would be necessary for a city fire engine to pump the water so as to raise the pressure from the 70 pounds city pressure to the 100 pounds required by the system but a booster pump will shortly be installed to provide the higher pressure before the arrival of a fire engine.

Battery of 39 direct driven rotary lube pumps which pump lubes from storage tanks on right to the floor above. These pumps are controlled from the barrel filling department

Barrel filling department. There are 39 outlets for lubes. These fillers stop the flow of oil when the barrel is filled. Automatic scales are imbedded in the floor in the distance. Barreled oil storage is at right. Car loading platform is outside doors in background



Hand trucks and electric lifts make handling of barreled oils easier in the Pure Oil terminal

Foamite pipe lines run to all the vertical and horizontal light oil tanks with control valves 50 or more feet away from each tank. The line to the battery of horizontal tanks runs first to a control manifold set outside the light oil pump house which acts as a shield against heat in case of a fire in those tanks.

Forty-gallon portable and hand foamite extinguishers are placed throughout the terminal. There also is a portable foamite mixer in the foamite pump house and water plugs about the plant to which this portable mixer may be attached. Fire alarm boxes are also scattered through the plant.

The five large vertical tanks are equipped with Oceco venting and flame arresting devices. Each of the large tanks has a 6-inch push and pull vent to care for expansion and contraction of liquid and vapors inside the tank. Each tank also has a 4-inch Oceco oil seal vent. Horizontal tanks are equipped with McDonald vents with fire screens.

A concrete rectangular dike with 6-inch walls has been built around the 10 horizontal tanks. This dike has a capacity of one and a half times the capacity of the tanks to comply with the Cincinnati fire code.

Around four of the large vertical tanks have been built unique circular dikes which cost as much as the 250,000-gallon tanks themselves cost. The circular concrete walls are six inches thick and the dike has a diameter about eight feet larger than the diameter of the tanks to provide the required capacity.

As it is necessary for workmen to go to the bottom of each dike twice a day to open in the morning and close in the evening the valves in the pipe lines to these tanks, a ventilating system has been installed. Two 8-inch galvanized sheet iron pipes have been run down the inside of each dike so the opening is near the bottom. The tops are several feet above the tops of the surrounding wall. Globular vaned suction devices are set on the top of the pipe and the wind actuating these globes pulls vapors from the bottom of the dikes.

In reaching the valves the workman mounts stairs to the tops of the walls and then goes down steel ladders built on the sides of the tanks. These ladders as are the stairs and runways on the horizontal tanks outdoors, around the lube tanks in the basement, and all warehouse stairs, are of steel grating. The grating provides safe footing in all kinds of weather.

Winches for the swing lines in the large tanks are placed outside the walls and the cables pass through vapor tight sheaves. Vapor tight thief holes also are used.

A dike was not required by the city for the kerosene tank.

All stairs to the tanks are illuminated. The wiring and lighting system also is vapor tight.

Flood Control

Flood control, something which oil companies will have to consider when they build bulk plants to take advantage of the growing use of our inland waterways, is a feature of the Pure Oil terminal.

Provision has been made to connect quickly the city water supply with the fill lines of all tanks which might be floated in case of an unusually high flood. With the opening of the Ohio river channel it is hoped that the flood emergency system may never have to be used but it is there in case of a recurrence of the flood stages of 1885 and 1913.

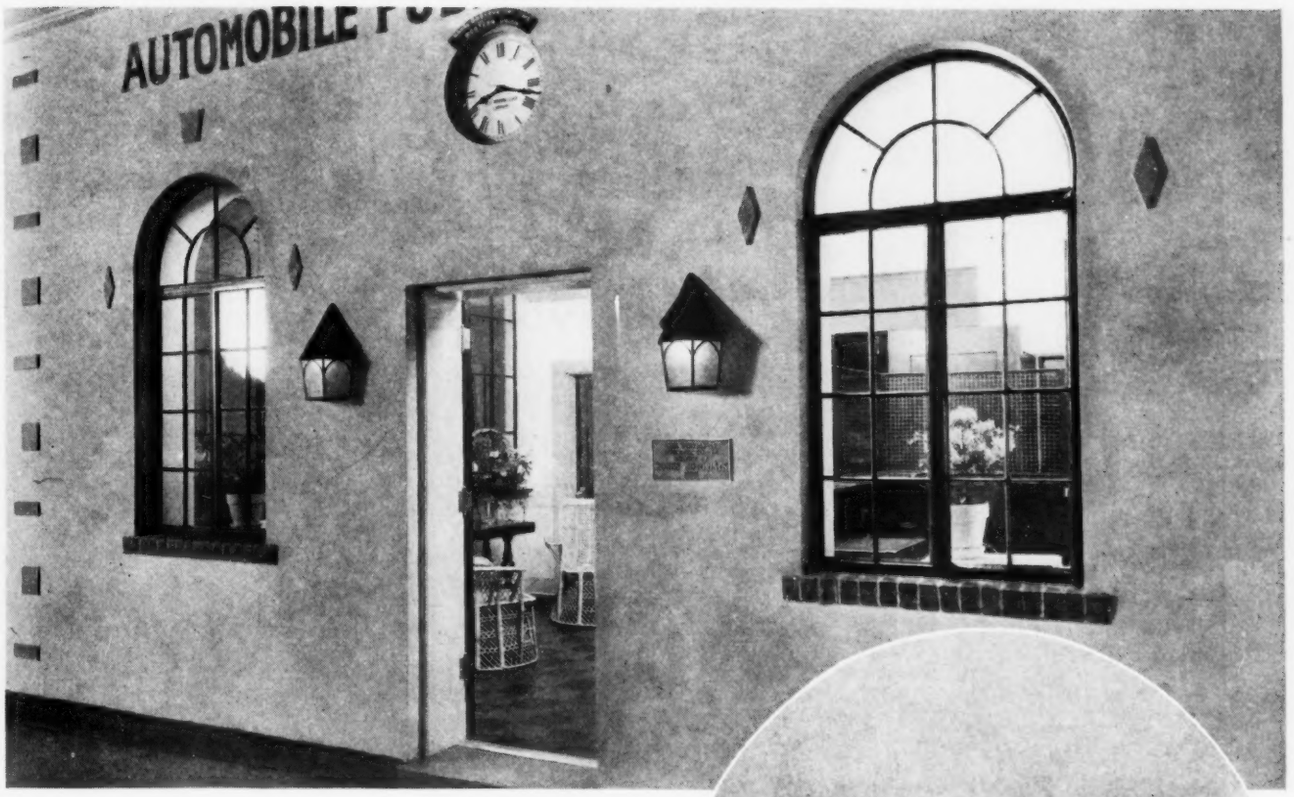
Garages

Housing for 26 pieces of motor equipment is provided in sectional steel garages on a lot near the terminal proper. The buildings are set in four units around a quadrangle. All are of Ideco fabrication.

One unit houses a repair department for minor servicing; major overhauling is done in the company's divisional repair shop at Columbus, O. This shop and a laundry department in another section are lined with Celotex insulation.

(*The End*)

ADVERTISING PAGES REMOVED



The office front with the tablet telling that the station is dedicated to women motorists. See layout of station on page 92

America's First Service Station Dedicated to Women

By Roger B. Stafford
N. P. N. STAFF WRITER

WASHINGTON

"TO THE ladies!

This is the toast of the Automobile Public Service Corp. which a few weeks ago opened in the national capital America's first automobile service station dedicated to the automotive needs of women motorists.

The concern is a merchant company, and its Washington station is the result of months of study of merchandising gasoline, oils and automobile service from the small filling stations to the big one-stop enterprises.

The corporation does no jobbing or commercial business. Its station was built to sell gasoline and automobile requirements and service to individual car owners, particularly the ladies. And it has not hesitated to tell the world that it recognizes that women buyers are important factors in today's automobile after-market. Beside the door to the station office and the attractive lounge where women may wait while their cars are being lubricated or tires changed, is a bronze tablet which reads:

"This Station is Dedicated to the Service of Women Motorists—1930."

This station is unique in another way too. It sells 16 brands of gasoline through 19 pumps. Only two widely known motor fuels wholesaled in Washington are missing from this station's pump islands.

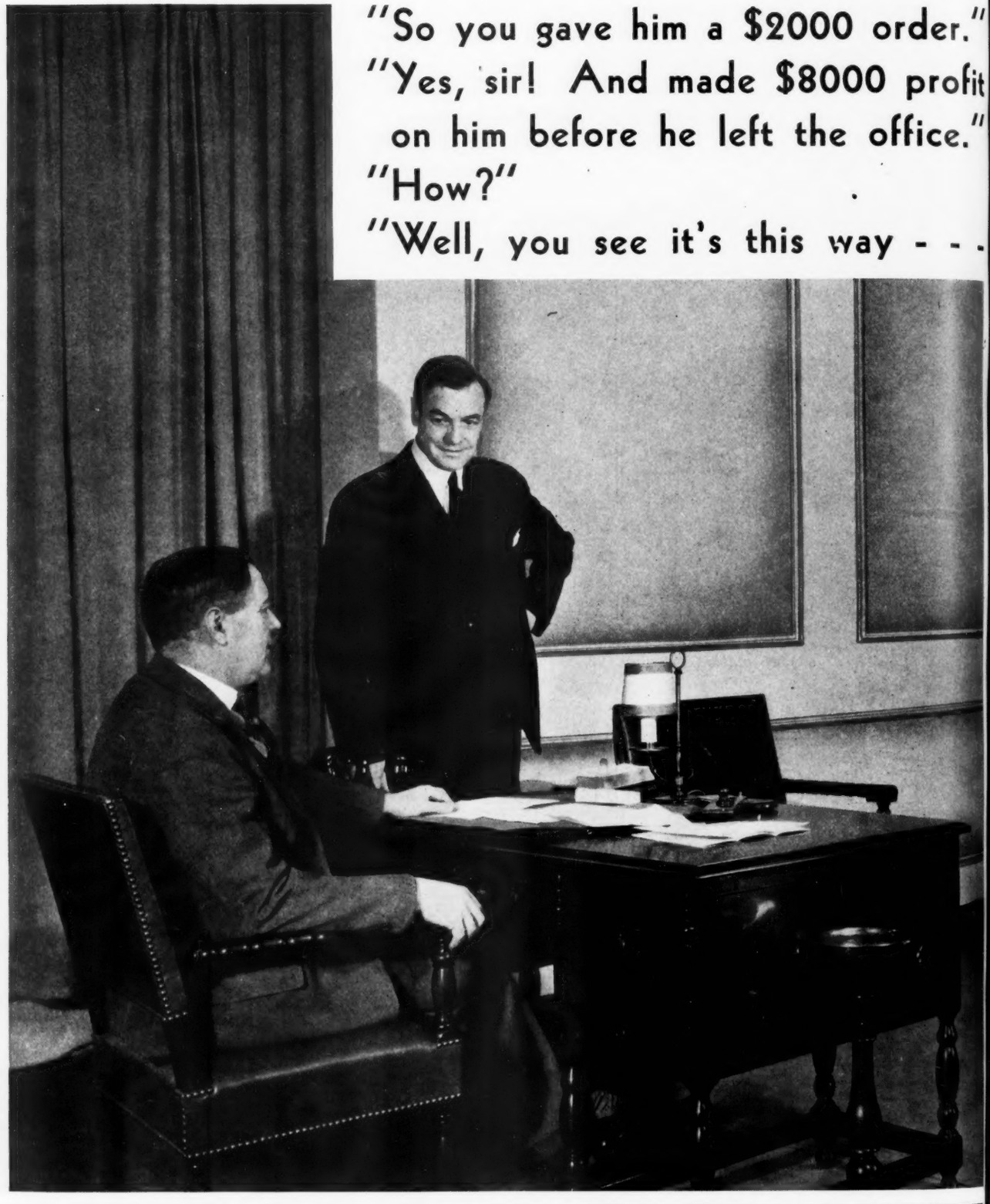
Edison H. Baker, president of the company, has spent many years in business research and at one time was associated with the research activities of the Bankers' Trust Co., New York. This is the way he explains the dedication of the station:

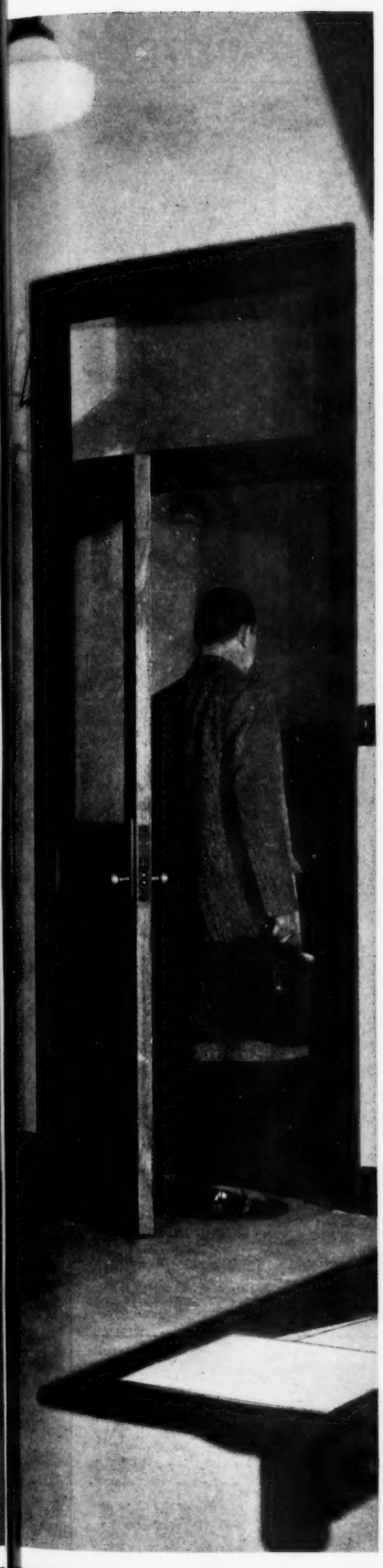
"Our observation and experience in business has impressed upon us the fact that, during recent years, the woman motorist has rapidly become a more and more important factor, until at the present time in the city of Washington alone there are upwards of 30,000 women drivers, representing more than 17 per cent of the total passenger car drivers' licenses issued in the District of Columbia.

"This number, of course, does not include transients and tourists or those registered in the neighboring sections of Maryland and Virginia. Further substantiating figures are those of the American Automobile Association which show that women represent approximately the same proportion of its District of Columbia membership.

"Notwithstanding the importance of this fact, we realized that, in order to make a satisfactory appeal to this group of motorists, it would be necessary to have a physical layout of the first order, including buildings, equip-

(*Continued on Page 96*)


"So you gave him a $2000 order."
"Yes, sir! And made $8000 profit on him before he left the office."
"How?"
"Well, you see it's this way - - -



HE walked out of here with a $2000 order and left me ideas worth at least $10,000 to our company. Oh, Boy, what a trimming I just gave that fellow.»

«What's his business?»

«He's the Meyercord decalcomania man.»

«For window-signs, eh?»

«For window-signs, yes, and delivery trucks and supply tanks and name plates and cartons and bill-boards and containers and pumps and wagons—for all kinds and sizes of identification space. At last, Bill, every single thing we use to sell, deliver or dispense our line will carry the same, familiar, emphasized trade-mark.»

«Why, we've done the same thing with lithography and metal tags and gold leaf, haven't we?»

«Oh, no we haven't. All those media, besides costing a lot of money, never gave us the perfect duplication that we'll get from decalcomania. What's more, this Meyercord man just showed me identification space worth thousands of dollars that we've been wasting entirely. Now we can use this one standard medium wherever our trade-mark appears, and no matter what the size or surface, every reproduction will be identical in design, drawing and full color. And all for $2000, Bill. Think how far $2000 would go just for trucks at $80.00 a job, hand-lettered.»

«Yes, $2000.00 for just the materials. Who'll we get to direct the new program?»

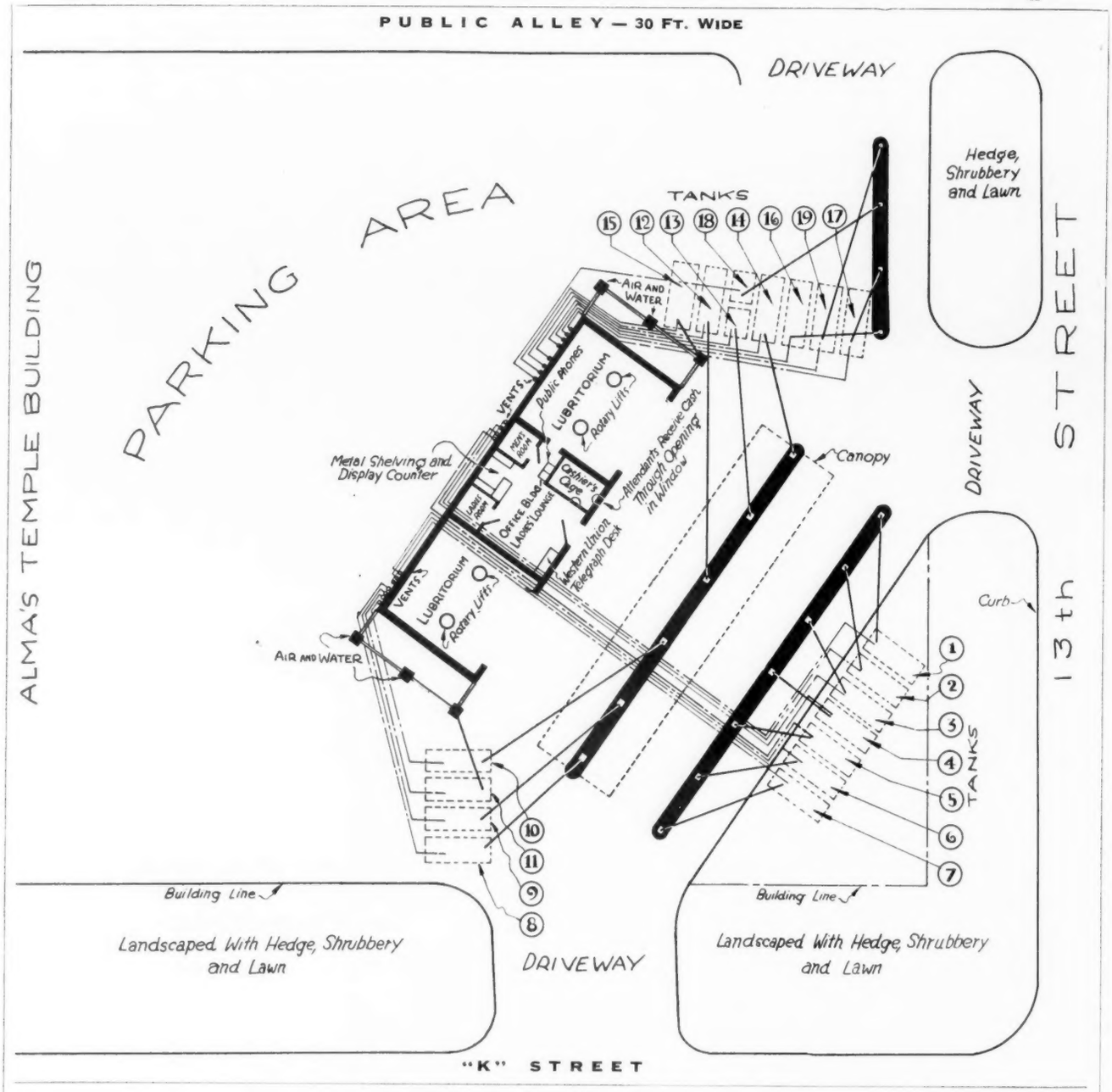
«2000.00 covers it all. When we buy Meyercord materials, we're finished. Their service department, with the biggest decalcomania staff in the industry, draws the trade-mark, designs its coloring, supervises its placing and analyzes our whole company for identification space. That's why I feel so good over this Meyercord deal. For $2000.00 we got materials that would have cost us at least $4000.00 for lithography, metal plates, gold-leaf, and the rest; we've been shown over $8000.00 worth of identification space we've never used; and a staff of a hundred experienced Meyercord artists takes over the centralized direction of our whole identification program. That's what I got from the Meyercord man. Boy, oh boy, what a trimming for him!»

Every day the Meyercord representative is «trimmed.» Every day new merchandisers discover for the first time the practical thorough identification achieved by Meyercord, through the use of the practical thorough publicizing medium—decalcomania. Meyercord service offers the same uniform, supervized identification for your product. Valuable data concerning your own publicity program will be sent on request.

D TRANSFERS

THE MEYERCORD COMPANY
120 S. LaSalle Street
CHICAGO, ILLINOIS

Layout of Station with 19 Gasoline Pumps

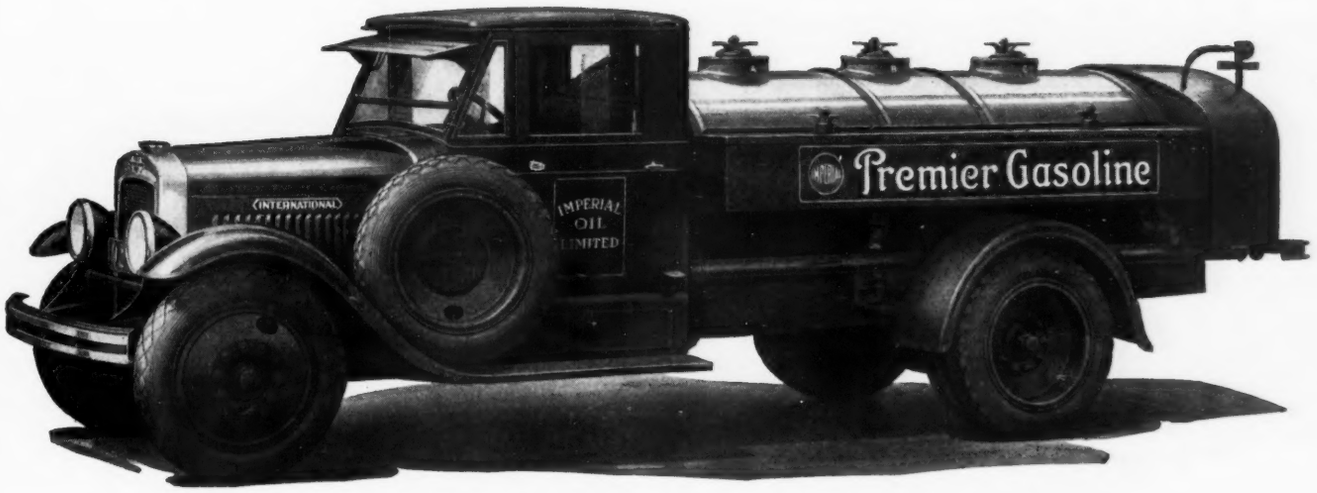


LEGEND

① TEXACO-Texas Oil Co.
② HI-TEST TYDOL-Taylor-Korman Oil Co.
③ AMOCO-American Oil Co.
④ AMERICAN ORANGE-American Oil Co.
⑤ Esso-Standard Oil of N. J.
⑥ INOCO-Independent Oil Co.
⑦ STANDARD STRAIGHT-Standard Oil of N. J
⑧ AMOCO-American Oil Co.
⑨ KOOLMOTOR-Crew Levick Co.
⑩ BETHOLENE-Sherwood Bros., Inc.
⑪ RICHFIELD ETHYL-Sherwood Bros., Inc.
⑫ STANDARD STRAIGHT-Standard Oil of N. J
⑬ TYDOL ETHYL-Taylor-Korman Oil Co.
⑭ Esso-Standard Oil of N. J.
⑮ BLUE SUNOCO-Loughborough Oil Co.
⑯ CITIES SERVICE-Crew Levick Co
⑰ GOOD GULF-Gulf Refing Co.
⑱ GULF NO-NOX-Gulf Refining Co
⑲ INDEPENDENT-Independent Oil Co.

Ground plan and tank and pump layout of the station of the Automobile Public Service Corp. at Washington described in accompanying article

Brand New!



This picture shows the new International Model A-5 Speed Truck, specially equipped for Imperial Oil service. The gigantic fleet of International Trucks operated by Imperial Oil, Ltd., Canada, offers convincing evidence of International's triumph in truck engineering and popular approval.

A 3-Ton 6-cylinder Speed Truck

Here is the new 3-ton 6-cylinder International Speed Truck—Model A-5—now on view at all of the 159 Company-owned International Branches in the United States.

***Brief Specifications of Model* A-5**

Wheelbase: 156, 170, 190 or 210 in.

Engine: International design and manufacture; 6-cylinder, valve-in-head, 7-bearing crankshaft, 7-bearing camshaft, removable cylinders; 3-point mounting with rubber-cushioned rear supports; pressure lubrication.

Clutch: Single plate, with built-in vibration damper.

Transmission: 5 speeds forward, 1 reverse, direct in high; one control lever.

Final Drive: Spiral bevel gear type.

Frame: Pressed-steel channel type, with deep middle section.

Springs: Semi-elliptic, front and rear. Auxiliary springs, quarter-elliptic.

Tires: 34 x 7 front, 34 x 7 dual rear, pneumatic, mounted on all-steel spoke-type wheels.

Brakes: Service, 4-wheel mechanical, internal expanding. Emergency, internal expanding on rear.

Sponsored by twenty-six years of automotive achievement, this latest member of the International line of trucks is definitely designed to provide the widest range of modern hauling service ever embodied in one truck.

The chassis itself, ready alike for high-speed transport and for the severe punishment of dump truck service, is being hailed as an outstanding advancement in automotive engineering. Be sure to read the specifications given at the left.

And Model A-5, as shown in the illustration, is as attractive in appearance as it is powerful in performance. Trim in silhouette and so obviously in tune with the times, it is a truck of which any owner may be proud.

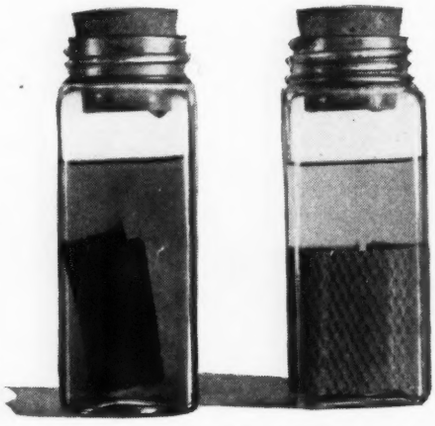
Favor the new 3-ton International Speed Truck with an exacting examination at the nearest International Branch, then ask for a demonstration of its prowess on your own job. Doing so will not place you under the slightest obligation.

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
(INCORPORATED)

606 S. Michigan Ave. Chicago, Illinois

INTERNATIONAL TRUCKS

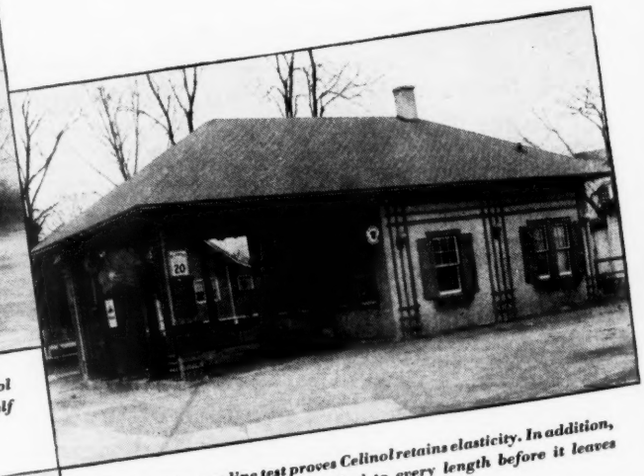
Tests show resistance of the rotting effect o



Bottle at left contains a piece of ordinary rubber; right, a piece of Celinol, immersed in gasoline. After sixty days the Celinol still retains its toughness and elasticity, while the other rubber has become gummy and has discolored the gasoline!

Celinol . . . a Goodrich "miracle in rubber" unaffected by gasoline. Immersion test shows hose retains elasticity and toughness.

Profits here are not cut by frequent replacement expenses. Celinol sealing layer on hose will not dissolve in gasoline. See for yourself by making the test above.



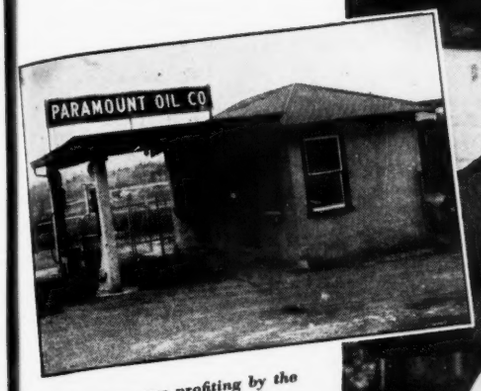
The sixty day gasoline test proves Celinol retains elasticity. In addition, a 24-month guarantee is attached to every length before it leaves the factory.

Well run service stations choose Celinol hose because, under test, it shows 50% less deterioration in tensile strength than sealing layers used in ordinary hoses.

A service station like this requires efficient operation. Celinol-lined hose swells only one-third as much as ordinary rubber.

# of GOODRICH HOSE to ct of Gasoline

Service men who have made the simple immersion test of Celinol now avoid frequent replacement costs.



p-to-date stations are profiting by the velopment of Goodrich Celinol hose ining.

OODRICH GASOLINE HOSE—*A Flexible metal tube; B—Celinol aling layer; C—Jacket made of ard twisted yarn woven tightly to prevent absorption of water and oil. Pre-shrunk to prevent loosening.*

GOODRICH Gasoline Hose

Another B. F. Goodrich Product

THE B. F. GOODRICH RUBBER CO. N.P.N. 4-30
Akron, Ohio

Gentlemen: Please send me a small sample of Celinol sealing layer so that I may test its superiority myself.

Name_____

Firm_____

Address_____

Automobile Public Service Corp. station at 13th and K streets, N. W., Washington, D. C. Gasoline, oils, chassis lubrication, tires, batteries and parking are merchandised. Plans for a laundry are being drawn

ment and general surroundings, to lend a suitable background to a high standard of operations. This, combined with our strict management and operating policy, constituted our basis for rendering a quality of service which would prove attractive to the woman motorist. As a part of these special facilities a ladies' lounge and rest room are provided, with the modern comforts and conveniences available, while the cars of women motorists are being serviced."

Cleanliness is one of the greatest factors of appeal to women, the management of this station believes, and employes are charged with maintaining cleanliness at all times. The employes are expected to pay especial attention to the cars of women customers.

Only new money, coin or currency, is given as change to women customers. This money is obtained directly from the U. S. Treasury department which is less than seven minutes' walk from the station. This consideration is appreciated by women customers and all pump attendants are instructed when they present a bill to the cashier to say whether it is for a woman. The men get "run of the till" money in change.

Another feature of this station is the road information bureau. Road information is given to telephone inquiries as well as to persons that call at the station. There are maps for tourists. Travel literature also is available.

The company is an authorized agent of the Western Union Telegraph Co. and will receive messages for transmission. The office contains a small desk where the telegrams may be written. Messenger service for sending the messages to the transmission offices of the Western Union, is described as being prompt.

Naval Observatory time, corrected hourly, is given out to telephone inquirers as "Automobile Public Service Correct Time" as a complimentary service to the public.

This station is built on a lot approximately 150 feet square at 13th and K streets N. W., Washington. These two streets are wide automobile thoroughfares. No car tracks are on them. The location is within walking distance of shopping, theater, financial, hotel and club districts of downtown Washington.

The station building is of cream stucco, with red brick and tile trim and red tile roof. There are three pump islands with an overall length of 200 feet and 70 feet of canopy over one island. The canopy has a red tile roof. Two islands are not covered.

Along the street frontages the grounds have been prettily landscaped. Shrubs and evergreens have been used profusely. Across K street is Franklin park, one of the many green squares in Washington. Adjoining the station lot on the K street side is the new clubhouse of the Almas Temple club which has 6000 members and owns the land on which the station is built.

Few signs are used about the station in addition to the pump globes and the emblems of the supplying companies on the motor oil tank and pump outfits on the islands.

"It was necessary for several reasons," Mr. Baker explained, "for us to minimize the display of advertising signs about the station with the exception of pump globes and identifying trademarks on tanks for lubricating oil. Display signs are less objectionable in the smaller type of station where possibly only the two or three brands of gasoline and oil of a single supplying company are distributed. But it is readily seen that, in the case of a large station such as ours, with more than 25 brands of gasolines and oils, to say nothing of its tires, batteries and accessories, this policy is not only of objectionable merchandising merit but it is particularly inadvisable from the point of view of the general appearance of the station."

To maintain good appearance the company has permitted only red to be used on its 19 electric meter pumps. Gasoline companies which have used other colors than red on their pumps have made this concession to maintain the good appearance of the station.

The station and service grounds are illuminated at night with five pairs of floodlights with 1000 watt lamps. Under the 70-foot island are four 500-watt lamps with reflectors. The latter type of lighting is used in the lubritoriums and office and lounge. Interiors are finished in cream which makes them light both day and night.

There are two steam heated lubritoriums, each with two lifts. The lubritoriums are in the ends of the station building. Air compressors, grease compressors and steam heating plant are in the basement. The lubritoriums are connected with an oil sump installed under the direction of the plumbing department of the District of Columbia and crankcase drainings are discharged into a receiving tank at the rear of the building.

The attendants wear blue and white striped unionalls of standard design with the words "Public Service" in white across the back. Black whipcord caps of semi-rigid style, plain shirt, black tie, and black shoes complete the uniform. On the front of each cap is a shield with the name of the corporation and the number of the employe.

The manager of the station, Robert L. Royall, who also is treasurer of the corporation, and his assistants

ADVERTISING PAGES REMOVED

wear blue service coats with "Public Service" woven in white across the back.

Rules and regulations to govern the deportment of each employe have been printed and a framed copy has been posted inside the station where it will be a constant reminder of conduct the company requires in its effort to please the motoring public. Disobedience is penalized by discharge.

The variety of motor fuels and oils carried is intended to meet the whims of the car owner who buys one and only one brand of gasoline. So this station meets this buying mood by supplying almost all the brands for which there might be much call.

In deciding which brands to stock the most of, Mr. Baker consulted the gasoline tax reports of the District of Columbia and found the most popular brands were sold by two companies who did slightly more than 50 per cent of the gallonage of the district. Two grades made by one of these companies and the most popular grade made by the other were each awarded two pumps in this unusual set-up. There is just one pump for each of 13 other brands, many of which are now advertised nationally in the magazines.

The premium gasolines carried are:

Amoco, two pumps, supplied by the American Oil Co. of Baltimore (Fifty per cent owned by the Standard Oil Co. of Indiana through the Pan American Petroleum & Transport Co.)

Betholene, one pump, Sherwood Bros. of Baltimore (Richfield Oil Corp. of New York.)

Esso, two pumps, Standard Oil Co. of New Jersey.

Inoco, one pump, Independent Oil Co. of Washington. This gasoline sells at 2 cents discount to members of the American Automobile Association through an arrangement with the supplying company.

Koolmotor, one pump, Crew Levick Co. (Cities Service).

No-Nox, one pump, Gulf Refining Co.

Richfield Ethyl, one pump, Sherwood Bros. (Richfield).

Tydol Ethyl, one pump, Tide Water Oil Sales Corp.

Non-premium gasolines stocked are:

American Orange, one pump, American Oil Co.

Standard New Process, two pumps, Standard of New Jersey.

Cities Service Straight, one pump, Crew Levick.

Independent, one pump, Independent Oil Co. (Carries 2-cent discount to A.A.A. members).

Sunoco Blue Motor Fuel, one pump, Sun Oil Co.

Gulf, one pump, Gulf Refining Co.

Texaco, one pump, The Texas Co.

Tydol Hi-Test, one pump, Tide Water.

The following brands of motor oils are delivered directly from suppliers' authorized containers:

Pennzoil Co., The Pennzoil Co.

Koolmotor, Cities Service Oil Co.

Amoco, American Oil Co.

Premium, Independent Oil Co. (A.A.A.)

Texaco, The Texas Co.

Quaker State, Quaker State Oil Refining Co.

Mobiloil, Vacuum Oil Co.

Veedol, Tide Water Oil Sales Corp.

Standard, Standard of New Jersey.

Gulf, Gulf Refining Co.

Plans are being drawn for a conveyor type car laundry to be housed in a 140-foot building along one end of the station lot. This laundry will have an estimated capacity of 300 cars a day.

Cars waiting to be washed or those that are stored after washing will be placed in the company's own parking yard and kept off the streets. The parking space has an estimated turnover of 300 cars a day. There will be day and night parking.

Parking rates are 25 cents for the first three hours and 5 cents an hour for each additional hour to a maximum of 50 cents for 12 hours. There is a special night theater rate of 25 cents. The monthly rate is $7.50 for a 12-hour day; $5 for a 12-hour night, and $10 for combined day and night parking.

A department for tires and batteries is planned in connection with the laundry. Service in this department will include tire changing and tube repairs but casing repairs and vulcanizing will be sent out. No provision is being made for battery and ignition service, brake testing and wheel aligning, as the company believes this work requires specialized knowledge.

The company is handling Firestone tires and batteries. At the opening an address was made to 50 guests by James Petty, manager of the Fire-

Ten Rules For Employees

(Posted at the station by the Automobile Public Service Corp.)

COURTESY

RULE 1—Courtesy is demanded of every employe, not alone to customers but between employes themselves. Courtesy comes first in all things.

CLEANLINESS

RULE 2—Cleanliness must prevail in every department of the business. Employes will be held to strict account for any laxity in keeping premises, buildings and equipment spotlessly clean. No excuse whatever will be accepted for dirt and disorder.

PERSONAL APPEARANCE

RULE 3—It is required of all employes that they be neat in their personal appearance, including clean linen, service clothes and shoes, and also be clean shaven. And so far as possible have clean hands.

DEPORTMENT

RULE 4—No profanity, loud talking, joking or horseplay will be permitted.

LOAFING

RULE 5—No loafing or gathering together, or idle discussion between employes will be allowed.

VISITORS

RULE 6—No employe will be allowed to have idle visitors hanging around.

PERSONAL HABITS

RULE 7—No chewing of gum or tobacco, hawking or spitting, whistling or singing will be permitted.

NO SMOKING

RULE 8—The Company will not retain in its employ men who violate this rule.

INFORMATION

RULE 9—Employes are not allowed to give out information of the Company's affairs or in any way discuss them with outsiders.

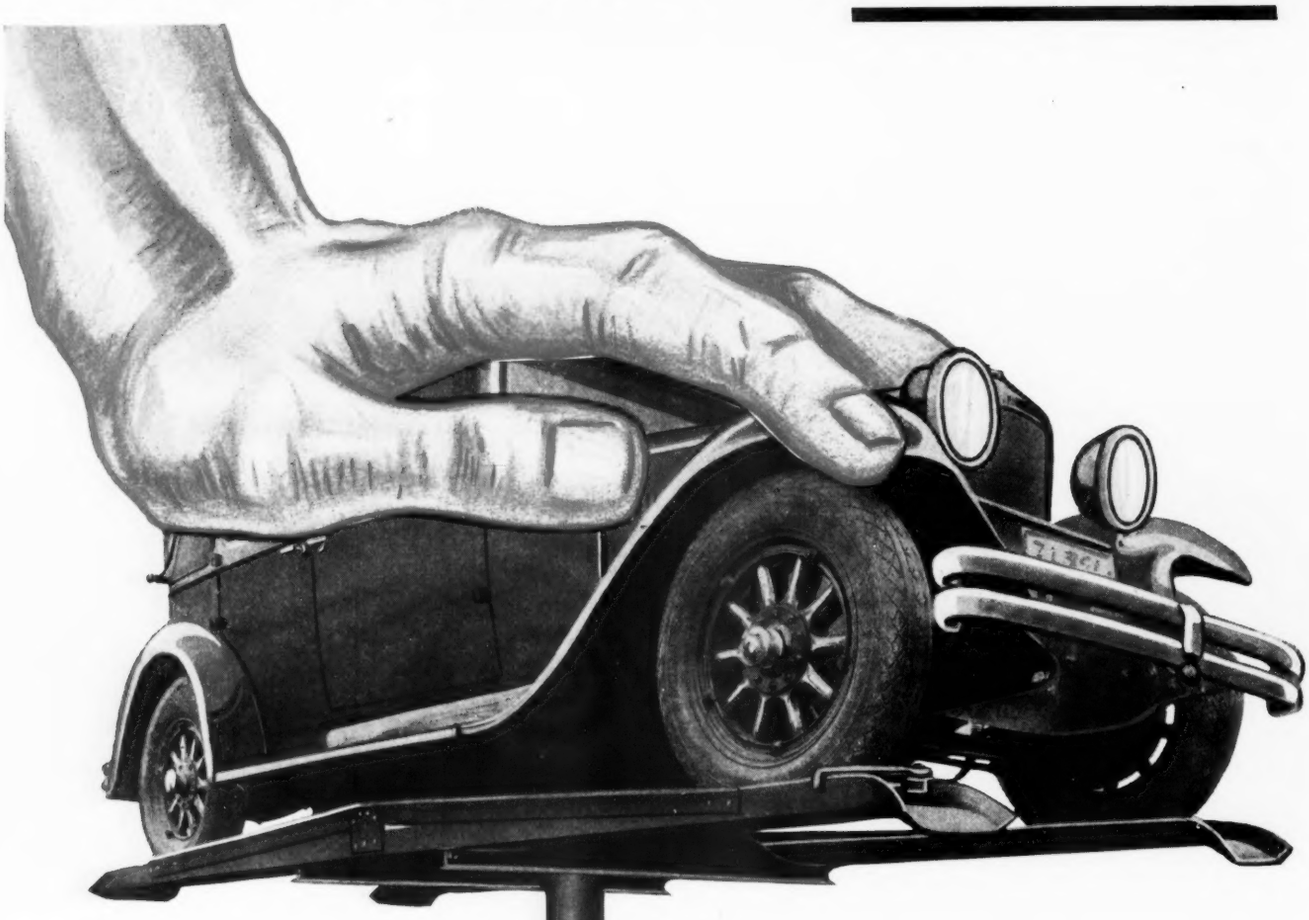
PROMPTNESS

RULE 10—All employes are required to be on time according to the hour they are to report for work.

REWARD

Employes are rewarded according to their value to the Company.

You can't Keep a



OUTSTANDING SUPERIORITIES:

(1) *No packing gland nuisance*
(2) *One-third to one-half less air pressure required*
(3) *Smoother operation without binding*
(4) *No oil leaks—no surface drainage*
(5) *Easier rotating*
(6) *Minimum maintenance—years of service without service-ing*
(7) *Insured safety*
(8) *Complete, continuous merchandising assistance*
(9) *Unqualified guarantee of complete satisfaction.*

The operating principle of Globe Auto Hoist has been used by Globe since 1918 under U. S. and Canadian patents. Patents applied for in principal foreign countries.

GLOBE *Auto* HOIST

a Good Lift DOWN!

It'll be UP making money!
Never down for repairs
—and very rarely idle

You don't want an automobile lift just for the pleasure of seeing it lazily resting on the ground. You want it for these three good reasons:

1st: Because you can reasonably expect it to attract new business.
2nd: Because it will permit a man to do quicker and better work.
3rd: Because it will increase your net profits on grease jobs, car washings, oil changes, etc.

The wise oil marketer considers these reasons just as carefully in making a selection of the right lift as he does in deciding that a lift has become an essential tool for his work. That's why Globe Auto Hoist is the choice of oil marketers the world over. And that's why *you* need Globe Auto Hoist!

Owners of Globe Auto Hoist are benefiting every day in the year from the Globe Merchandising Plan,—a series of free sales helps designed to attract and hold business. No other lift offers such effective, resultful merchandising assistance, the kind which keeps a lift *UP AND DOING*—earning money.

Investigate Globe Auto Hoist! Compare it with any other lift on the market. Learn the real significance of the exclusive principle of "Hi-Preg" unit construction, and other vitally important features.

Write us today for full description and prices.

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Supply Co.

GLOBE MACHINERY & SUPPLY CO.

205 West Court Avenue **Des Moines, Iowa**

GLOBE *Auto* HOIST

stone factory branch in Washington. The tablet dedicating the station to women motorists was unveiled by Miss Hazel Raynolds, Bethesda, Md., who won first prize in a recently completed instruction course for women drivers conducted by the A.A.A.'s District of Columbia division.

Besides Mr. Baker and Mr. Royall, the official family of the company is made up of Thomas B. Tyson, vice-president and secretary.

Tennessee to Test Gasoline and Kerosene at the Pump

CLEVELAND, April 2

TENNESSEE intends to carry its inspection of gasoline and kerosene direct to the filling station and tank wagon under the inspection law passed in that state last year. A testing laboratory has been fitted into a Ford panel body truck and four field inspectors have been hired.

The state has set as its minimum standard for gasoline the U. S. Motor specifications before those specifications were modified last June by eliminating a maximum initial boiling point and the 20 per cent point and inserting a range of temperatures for the 10 per cent recovery point.

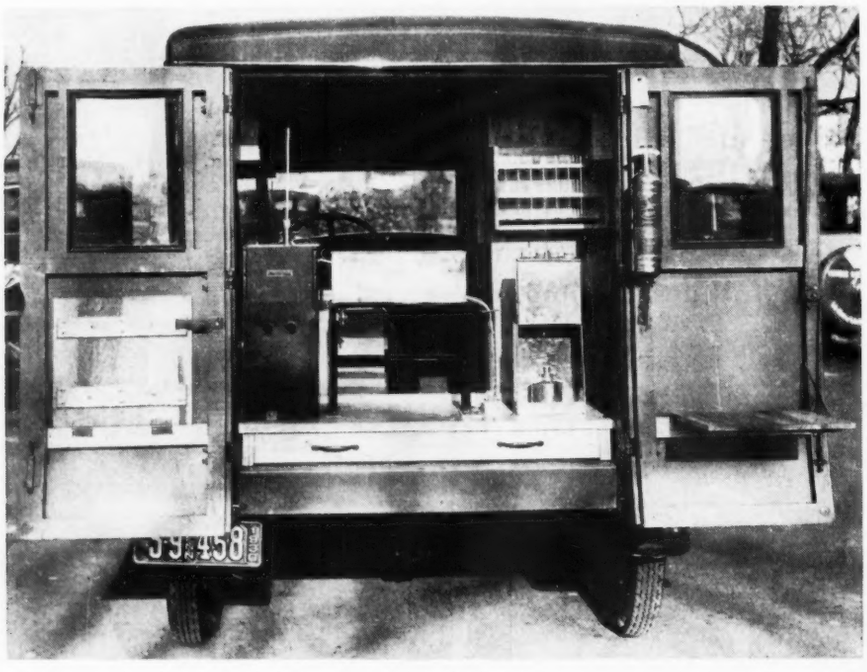
The U. S. specifications for kerosene were adopted and the following specifications for fuel or furnace oils: light straw color; 35 to 37 degrees, Be., gravity; flash not over 175 degrees F.; initial boiling point approximately 400 degrees F.; end point under 630 degrees F.; zero cold test, and sulfur content under 0.75 per cent.

Every dealer or seller of gasoline in the state must display a sign that is satisfactory to the inspector-at-large, which sign shall read: "State Approved Gasoline Sold Here." These signs must be attached to pumps or tank trucks in such a manner that they may be easily read by customers.

The portable laboratory is equipped with all the instruments used in testing the volatile petroleum products and may visit bulk plants, service stations or stop tank trucks on the road to test the products. All products having a Baume gravity of 16 degrees or higher are subject to inspection. Benzol is included with the petroleum derivatives, but lubricating oils are excluded.

When gasoline is found to contain heavy ends or fails to meet the corrosion test, the container shall be marked: "This gasoline contains kerosene and has been condemned by the state of Tennessee," or "This gasoline is corrosive and has been condemned by the state of Tennessee." A pump has been interpreted to be a receptacle in the meaning of the Tennessee law.

When these caution notices have been attached and sealed, contents of the tank to which the notices have been attached shall be removed only through the pump bearing the notice which may be removed only by the deputy inspector-at-large or an inspector the deputy designates. Penalty for violation of this provision is a fine of not more than $100 or imprisonment of not more than 60 days or both.



Tennessee's roving test car

CINCINNATI, O.—The Halstead Oil Co., Inc., manufacturer of Springeez oil, is moving its headquarters from New York City to Cincinnati, according to George F. Dana, vice president.

It will locate in the Union Central Life Insurance Bldg. where it will occupy a suite of offices. The move will be made the latter part of May.

The company will also maintain a warehouse here. It has other such plants in New York City, Boston, St. Louis and Oakland, Calif. The factory is at Oakland.

Station on Site Where All Routes Meet

PETERSBURG, Va., April 3.—The dream of every oil marketer is to put his service station on a site that every motorist is compelled to pass.

Such a thing has been possible for the Delta Oil Co., Inc., Petersburg, which recently opened a super service station bordering three streets here, East Bank, Second and Henry streets.

All routes that lead into or out of Petersburg, north, south, east and west, converge at this point. This station is the only one so situated in southern Virginia, the company says.

The station, besides, is in the heart of the business district of Petersburg. It is but a half block away from the million dollar concrete bridge which spans the Appomattox River. It is the only station in this city that is open 24 hours of the day.

There are spacious drives and free parking space. All buildings are at the edge of the site to keep as much space as possible open for cars. On a half of the site is a canopy-covered pump island on which are four pumps. Greasing, car washing and service rooms are housed in the building at the rear of the lot. On the other half is the service station proper which is equipped with two double-head pumps.

* * *

RICHMOND, Va.—A super service station which will handle tires will be built at Charlotte, N. C. by General Tires, Inc., recently incorporated for $100,000 by W. R. Stroupe, A. M. Aiken and W. B. Burwell.

ADVERTISING PAGES REMOVED

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to the pick and shovel gang

YES . . . . and say it heartily! For here, at last, is a gasoline foot valve that is absolutely drop-tight . . . . that eliminates costly excavating in order to repair or replace leaky valves. Install this Jenkins Gasoline Foot Valve and you can pack up the pick and shelve the shovel.

Neither climatic changes, heavy traffic vibrations, nor the corrosive bite of high test gasoline can affect this new Jenkins. It provides drop-tight operation from the start. The valve disc, of special gasoline-resisting composition, makes a perfect contact with the seat, and so helps keep the pump always primed, ready instantly for correct delivery.

In one of the several tests that were conducted before the Jenkins Foot Valve was offered to the trade, a valve was opened and closed more than 700,000 times under actual service conditions. Although this test equaled more than 10 years average filling station service, examination of the seat and disc did not reveal a sign of wear, distortion or disintegration.

Let us send you the new illustrated folder giving complete details about the Jenkins Gasoline Foot Valve. Simply fill in and return the coupon. Jenkins Bros., 80 White Street, New York. Boston, Philadelphia, Chicago. Jenkins Bros., Ltd., Montreal, London.

Jenkins Bros.
80 White St.
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Please send folder giving details of the new Jenkins Gasoline Foot Valve.

N. P. N. 4-9-30

Name_____

Address_____

JENKINS VALVES — SINCE 1864

proof FOOT VALVE

What Walter Teagle Likes to See In a Salesman

(From Salesmotor, published by the Standard Oil Co. of New Jersey)

THERE are five characteristics that I like to see in a salesman, and I list them as follows:

First—as emphatically as it can be stated—a real acquaintance with and thorough knowledge of the line he represents. He should know a good deal about its manufacture if it is a factory product, or its background if it is a piece of paper like an insurance policy or a security. He should learn as much as possible about the competing lines, not to advertise their weak points but to know the advantages of the article or service he is selling.

Second, an honest enthusiasm. That is almost inevitable if the salesman has complied with rule number one. It is hard not to be enthusiastic about something good when we know that the fellows who produced it did an excellent piece of work. It is better to be over-enthusiastic than diffident.

Third, tact. A salesman must use his head. He should know when to stop talking and get out. Some of the prejudice with which salesmen are regarded is due to their habit of overstaying. If the prospect knows definitely what he wants and what he does not want and makes that clear, then the salesman has no right to impose further on his time.

Fourth, a careful regard for the truth. He should make no statements that are either meaningless or not susceptible of substantiation. The seller can safely tell about past performances; he is on dangerous ground when he predicts results not to be expected on the basis of experience. The automobile salesman who tells you that "this is the ultimate car—the last word in efficiency and beauty" is apt to refer to it as a piece of junk a year later when he has a new model to display.

Fifth, sincerity. So many salesmen speak by rote. They learn a set talk prepared by the sales manager and try their level best to go through this talk at every opportunity. It is quite obvious to the prospect that it is not the salesman speaking but his master's voice. A trained parrot could do the job just as well if he could handle a pencil and order book.

Lastly, a liking for and determination to succeed at his work. If the salesman does not possess these qualities he will never be important. He should believe in the ability of his concern to back him up with quality and service and see to it that any promises he makes can be fulfilled.

Twenty-five years ago a small sized, slightly bald young man made his unobtrusive entrance on the floor of the New York Stock Exchange. He soon became the specialist for an industrial stock, a food product, then of little importance. In a few months, the specialist and the stock were equally well known throughout every office in Wall Street, for from alarm clock to pajamas that fellow talked nothing but the wonderful future this food product was going to have. And he knew what he was talking about, because he spent a great many hours digging up facts about the materials used by the company, its methods of manufacture, and possible markets.

In fact, he became the real authority on the company's business and as such was of value to the manufacturer as well as to the investor. His enthusiasm based on faith, that was based on knowledge, that was based on hard work, was ultimately rewarded by bringing him what he desired above all else, the satisfaction of seeing his early predictions made good and surpassed. There is a real salesman. If he never sells anything else he has done a real job on that stock.

I suppose nothing is more difficult to sell in downtown New York than life insurance, because here are concentrated the most successful, high-powered salesmen recruited from less productive areas the country over. It is difficult for a neophyte to get a hearing. Yet a man who had never studied insurance and never been a salesman took the financial district as his field when he started in ten years ago as a canvasser for one of the big mutual companies after failing as a business man. He was 50 years old and "flatter" than Kansas when he took his little red data book out for the first time.

Ten years later he was able to retire on a comfortable competence, all on commissions he had made selling life insurance. His own explanation was that he became so enthusiastic over the idea of service that he forgot the personal rewards in the pleasure he got in saving families from destitution after the death of the bread-winner. He sold life insurance as easily as Bobby Jones plays golf.

The word "guaranteed" is grossly abused, so that in most instances now it has no meaning whatever. In its place has come the unwritten pledge of good faith between buyer and seller. I like to see in a salesman an appreciation of the fact that he is "the company" when he is with his customer and that buyer and seller both are fair-minded people who are working for each other. Such a relationship endures.

HERE are the five factors that Walter C. Teagle, president of the Standard Oil Co. (New Jersey) believes most important to the success of a salesman, be it oil or other products he is selling.

1—Thorough knowledge of the products he is selling.

2—Honest enthusiasm.

3—Tact.

4—Careful regard for the truth.

5—Sincerity.

The accompanying article by Mr. Teagle enlarging on these important requirements for the salesman, appeared in Salesmotor, a publication of the Standard of New Jersey.

ST. LOUIS—Five oil specialties for home use have been introduced recently on the market by the Shell Petroleum Corp. here. They are Shell handy oil, for use in lubricating squeaky doors, sewing machines, vacuum cleaners and other household appliances; Kleanzit, for cleaning garments; fly spray, fly and insect exterminator; spot remover, for taking out dirt and grease spots from fabrics; and shell lighter fluid for cigaret lighters.

All these specialties come in small handy sized cans with screw tops.

Henry Mason Day Quits Sinclair Company

NEW YORK, April 2.—Henry Mason Day has resigned as vice president of the Sinclair Exploration Co. and will enter another business field, it has been announced by the Sinclair Consolidated Oil Corp. Announcement of Mr. Day's plans may be made later, it was indicated.

Mr. Day was associated with the Sinclair interests for about six years, representing them in negotiations for development concessions in Russia, Venezuela and Near Eastern fields.

He served a jail term in the District of Columbia last year for contempt of court, a charge which grew out of the shadowing by detectives of the jury in one of the Sinclair-Fall trials. He is said to have hired the detectives.

Which Quincy?

Actually, it is not necessary for you to go outside the Quincy Line for a compressor that will exactly fit the requirements of any Service Station or Garage.

The Quincy Line is so large, and every compressor so well designed and made, that the question is not, "which make of compressor?" but, "which Quincy?"

There are fourteen sizes, in this great Quincy Line, with displacements from only 1 cu. ft. per minute all the way up to 128 cu. ft., air cooled or water cooled, as required. These are supplied as individual compressors or in complete units of compressor, motor and tank.

To help you decide, "which Quincy," we will gladly supply all the information you want, without obligation of any kind. Just write, or mail the coupon below.

QUINCY COMPRESSOR CO.,
223 Maine St., Quincy, Ill.

Please send complete information about Quincy Compressors suitable for Service Stations and Garages.

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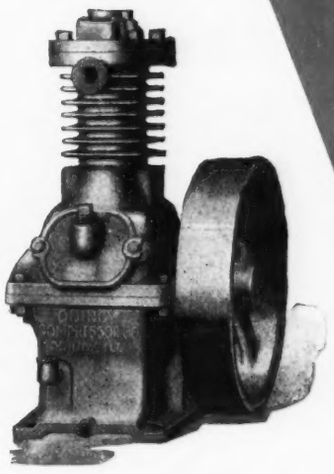
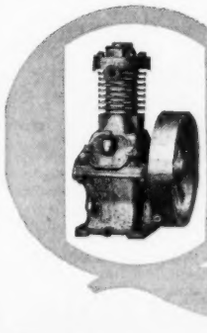


Model A

Air cooled and made in sizes from 1⅝ x 1½ to 4½ x 5. Displacements from 1 cu. ft. to 27 cu. ft., depending upon size of compressor, and motor used.

Furnished also with tight and loose pulleys, if desired, or with V-type pulley.

N-5



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National Petroleum News

American Association of Petroleum Geologists, Business Manager, J. P. D. Hull, Box 1852, Tulsa, Okla. Street Address: 504 Tulsa bldg., Tulsa.

American Chemical Society, Petroleum Division, Mills Bldg., Washington, D. C. Secretary, C. R. Wagner, Pure Oil Co., 35 E. Wacker Drive, Chicago, Ill.

American Gas Association, Graybar Bldg., 420 Lexington Ave., New York City. Secretary K. R. Boyes.

American Institute of Mining and Metallurgical Engineers, Petroleum Division, 29 West 39th St., New York. Secretary, Dr. H. C. George.

American Oil Burner Association, 342 Madison Ave., New York City. Executive Secretary, H. F. Tapp.

American Oil Chemist Society, 705 Tchoupitoulas St., New Orleans, La. Secretary-Treasurer, J. C. Helm.

American Petroleum Institute, 250 Park Ave., New York City. Executive Vice President, William R. Boyd, Jr.

American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Secretary-Treasurer, C. L. Warwick.
Committee D-2 (Petroleum), Dr. R. P. Anderson, American Petroleum Institute, 250 Park Ave., New York, N. Y., Secretary.

Arkansas-Tennessee Oil Marketers Association. Secretary, R. E. McKellar, care Diamond Oil Co., Memphis, Tenn.

Association of Producers of Petroleum in Mexico, 17 Battery Place, New York. Director, Guy Stevens.

Association of Producers of Petroleum in Venezuela, 17 Battery Place, New York City. Director, Guy Stevens.

California Natural Gasoline Association, 438 Subway Terminal Bldg., Los Angeles. Secretary, H. W. Parmelee, 850 Subway Terminal Bldg., Los Angeles, Calif.

California Oil & Gas Association. Managing Director, Edwin Higgins, 517 Associated Realty Bldg., Los Angeles, Calif.

Chicago Oil Men's Club, Secretary, R. J. Thompson, Apex Motor Fuel Co., 1401 W. North Ave., Chicago, Ill.

Cincinnati Oil Club. Care of Cincinnati Club, Cincinnati, O. President, E. J. Bengert, Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O.

Colorado Oil Dealers Association, The, 518 Denham Bldg., Denver, Col. Secretary, Charles L. Yancey.

Eastern Kentucky Oil Producers Association, Ashland, Ky. Secretary, David Browning.

Fire and Safety Marshals of the National Petroleum Association. President, James H. Herbert, Standard Oil Co. of Ohio, East Ohio Gas Bldg., Cleveland, O.

Georgia-Alabama Independent Petroleum Marketers Association. Secretary-Treasurer, W. L. Moore, Wofford Oil Co. of Georgia. Atlanta, Ga.

Georgia Independent Oil Marketers Association. Secretary-Treasurer, J. K. Ezell, American Oil Pump & Tank Co., P. O. Box 982, Atlanta, Ga.

Gulf Coast Independent Oil Producers Association, 403 Goggan Bldg., Houston, Tex. Secretary, T. L. Smith, Jr.

Illinois Petroleum Marketers Association. Secretary, G. A. Primm, Chamber of Commerce Bldg., Springfield, Ill.

Independent Oil Association of Oklahoma, 216 S. Morton Ave., Okmulgee, Okla. Secretary, C. I. O'Neill.

Independent Oil Men of America, Engineering Bldg., 205 W. Wacker Drive, Chicago, Ill. C. Y. Hinchey, Executive Manager.

Independent Oil Men's Association of Massachusetts. President, W. C. O'Meara, Quincy Oil Co., 56 Federal Ave., Quincy, Mass.

Independent Oil Men's Association of New England. P. A. Brewer, United Oil Co., Cambridge, Mass.

Independent Oil Producers Agency, Los Angeles. Secretary, W. B. Robb, 516 Union Oil Bldg., Los Angeles, Calif.

Independent Petroleum Association of America. Headquarters to be at Tulsa—secretary to be chosen. Wirt Franklin, Wirt Franklin Petroleum Corp., Ardmore, Okla., head.

Independent Petroleum Association of California. President, Verne Dumas, Apex Petroleum Corp., Los Angeles, Calif. Secretary, Ivey C. Clark, 240 E. Main St., Compton, Calif.

International Petroleum Exposition and Congress, Tulsa, Okla. Secretary, William Holden.

Independent Petroleum Marketers of Middle Atlantic States. (Changed to Pennsylvania Independent Oil Men's Assoc.)

Indiana Petroleum Association, 1014 De Quincy St., Indianapolis, Ind. Executive Secretary, Max L. Wickersham.

Iowa Petroleum Association, 207 Securities Bldg., Des Moines, Ia. Secretary, M. L. Long.

Kansas Oil Men's Association, 423 First National Bank Bldg., Wichita, Kan. Secretary, J. A. Motter.

Kentucky Oil Men's Association, Inc., 610 Trust Co. Bldg., Lexington, Ky. Secretary, Thomas S. Scott.

Kentucky Petroleum Marketers Association, 1301 E. Main St., Louisville, Ky. Secretary L. J. Connolly.

Louisiana-Arkansas Refiners Association, 1301 Slattery Bldg., Shreveport, La. L. C. Grasjean, Secretary.

Maine Independent Oil Dealers Association. President, Theodore E. Emery, Kennebec Oil Co., Augusta, Me.

Michigan Oil Men's Association, 207 West Franklin St., Jackson, Mich. H. H. Ragle, Executive Director; Walter A. Garvey, Field Secretary.

Michigan Oil & Gas Association, 207 W. Western Ave., Muskegon, Mich. President, E. J. Bouwsma, Citizens Petroleum Co., Muskegon, Mich.

Mid-Continent Oil & Gas Association, 308 Tulsa Bldg., Tulsa, Okla. Secretary, Harry H. Smith.
Kansas-Oklahoma Division, 308 Tulsa Bldg., Tulsa, Okla. Secretary, Harry H. Smith.
Louisiana-Arkansas Division, American National Bank Bldg., Shreveport, La. Secretary, Joseph B. Elam.
Texas Division, Kirby Bldg., Dallas, Texas. Secretary, J. P. Laney.

Minnesota Petroleum Association. (Changed to Northwest Petroleum Association, which see.)

Mississippi Oil Men's Association. Secretary, George B. Power, 501 Capital National Bank Bldg., Jackson, Miss.

Missouri Oil Men's Association, 370 Board of Trade Bldg., Kansas City, Mo. Secretary, George S. Allee.

National Association of Independent Oil Producers, 1525 Hunt Bldg., Tulsa, Okla. Secretary, H. A. Farley, P. O. Box 1858, Tulsa.

National Credit Men's Association, Petroleum Refiners Division, 936 First National Bank Bldg., 33 S. Clark St., Chicago, Ill. Secretary-Manager, R. A. Colliton, Commercial Bldg., Tulsa, Okla.

National Petroleum Association, Munsey Bldg., Washington, D. C. Washington Counsel, Fayette B. Dow.

Natural Gas & Petroleum Association of Canada, Chatham, Ont., Canada. Secretary, S. A. Morse.

Natural Gasoline Association of America, 305 Tulsa Bldg., Tulsa, Okla. Secretary, Ray E. Miller.

Nebraska Independent Oil Men's Association, 816-817 Terminal Bldg., Lincoln, Neb. Secretary, C. M. Sutherland.

New Jersey Oil Trade Association. Secretary, J. S. Henry, Henry Oil Co., P. O. Box 69, Morristown, N. J.

New York State Oil Producers Association, Wellsville, N. Y. President, Lewis H. Thornton.

New York State Petroleum Marketers Association, 1201 So. Salina St., Syracuse, N. Y. Secretary, Benjamin A. Javitz.

North Carolina Independent Oil Jobbers Association, Greensboro, N. C. Secretary-Treasurer, L. H. Martin, L. H. Martin, Inc., Greensboro, N. C.

North Dakota Petroleum Association. (Changed to Northwest Petroleum Association, which see.)

Northwest Independent Oil Association. Secretary, C. H. Brown, care Arro Oil & Refining Co., Lewiston, Mont.

Northwestern Pennsylvania Oil Producers Association, 78 Main St., Bradford, Pa. President, A. Edward Booth.

Northwest Petroleum Association, 638 Builders Exchange, Minneapolis, Minn. Secretary, Elwin E. Hadlick.

Ohio Gas & Oil Men's Association, 811 First National Bank Bldg., Columbus, O. Secretary, William H. Thompson.

Ohio Petroleum Marketers Association, 508 Ohio State Savings Bldg., Third and Gay Sts., Columbus, O. Executive Secretary, W. A. Milne

The Oil & Gas Well Supply Traffic Association. Secretary, V. E. Milsark, Parkersburg Rig & Reel Co., P. O. Box 751, Parkersburg, W. Va.

Oil Heating Institute, 342 Madison Ave., New York, N. Y. Secretary, H. F. Tapp.

Oil Trade Association of Baltimore, Md. Secretary, Arthur B. Gardner, 309 East Falls Ave., Baltimore, Md.

Oil Trade Association of Philadelphia, Inc. Secretary, Howard M. Rogers, Charles K. Smith Co., 123 Arch St., Philadelphia, Pa.

Oil Trades Association of New York City Inc., 35 So. William St., New York City Secretary, Joseph C. Smith, 15 Moore St., New York City.

Oklahoma Petroleum Marketers Association. Secretary, Frank Meaders, Meaders Oil Co., Ada, Okla.

Oklahoma Oil Marketers, Inc., P. O. Box 755, Enid, Okla. Secretary, W. W. Blackburne.

Osage Oil & Gas Lessees Association, 308 Tulsa Bldg., Tulsa, Okla. Secretary, Harry H. Smith.

Pennsylvania Grade Crude Oil Association, Levi Bldg., Oil City, Pa. Secretary, R. J. Alexander.

Pennsylvania Oil Men's Association, 601 Keystone Bldg., Harrisburg, Pa. Secretary, R. A. Overholser.

Pennsylvania Retail Gasoline Dealers' Association, Altoona, Pa. Secretary, A. W. Martin.

Petroleum Club of Central New York. Secretary, George R. Casey, Crown Oil Co., Syracuse, N. Y.

Petroleum Industry Electrical Association. Secretary, H. E. Browne, P. O. Box 60, Independence, Kans.

Petroleum Motor Transport Association. President, Roy F. Fike, Mid-Continent Petroleum Corp., Cosden Bldg., Tulsa, Okla.

Rocky Mountain Association of Petroleum Geologists, 834 First National Bank Bldg., Denver, Col. Secretary, W. A. Waldschmidt, 834 First National Bank Bldg., Denver, Colo.

Rocky Mountain Independent Oil Men's Association (formerly Colorado Petroleum Club), 411 Exchange Bldg., Denver, Colo. Secretary, A. Oberholtz, Jr.

Rocky Mountain Oil & Gas Association. Secretary, D. W. Greenburg, Midwest Refining Co., Casper, Wyo.

Rocky Mountain Oil & Gas Association, Montana Chapter, 222 Ford Bldg., Great Falls, Mont. Secretary, Walter F. Brittan.

South Dakota Independent Oil Jobbers Association, Sioux Falls, S. D. Secretary, F. H. Buehler, care Dacotah Oil Co., Madison, S. D.

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Southeastern Ohio Oil & Gas Producers Association, Logan, O. Secretary, W. L. Franks, Box 285, Logan, O.

St. Louis Petroleum Club. Secretary, R. F. Leinberger, 1516 Pine St., St. Louis, Mo.

Springfield Petroleum Club, Secretary, Ross Lock, c/o Lock Bros., Oil Co., Springfield, Ill.

State Executives Club. Secretary, Elwin E. Hadlick, Minnesota Petroleum Association, 638 Builders Exchange, Minneapolis, Minn.

Tank Car Association, 139 N. Clark St., Room 1015, Chicago, Ill. Manager, J. Arthur Kealy.

Technical Club of Oklahoma. Secretary, A. W. Burket, National Bank of Commerce Bldg., Tulsa, Okla.

Tennessee Oil Men's Association, Nashville, Tenn. Secretary, Lew W. Collins.

Texas Petroleum Marketers Association. Executive Secretary, L. H. Flinn, 915 Second National Bank Bldg., Houston, Tex.

Tulsa Purchasing Agents Association, 307-309 S. Cincinnati Ave., Tulsa, Okla. Secretary, H. M. Cosgrove, P. O. Box 1781, Tulsa.

Twin City Petroleum Club, Minneapolis, Minn. President, Perry C. Sanborn, John Hancock Oil Co., Minneapolis, Minn.

Underground Pipe Protection Institute, Room 1737, 17 Battery Place, New York City. Secretary-Treasurer, W. H. T. Thornhill.

Virginia Oil Men's Association, 418 E. Main St., Richmond, Va., Secretary, A. L. Tenser, Jr. Box 970, Richmond, Va.

West Virginia Oil and Natural Gas Association, Fairmont, W. Va. Secretary-Treasurer, Edwin Robinson.

West Virginia Oil Marketers Association, 515 Peoples Exchange Bank, Charleston, W. Va. M. L. Fling, Assistant Secretary-Treasurer.

Western Petroleum Refiners Association, Cosden Bldg., Tulsa, Okla. Managing Director, Howard Bennette.

Wisconsin Petroleum Association. Secretary, H. A. Rohde, Rohde-Deuster-Hinkley Oil Co., West Allis, Wisc.

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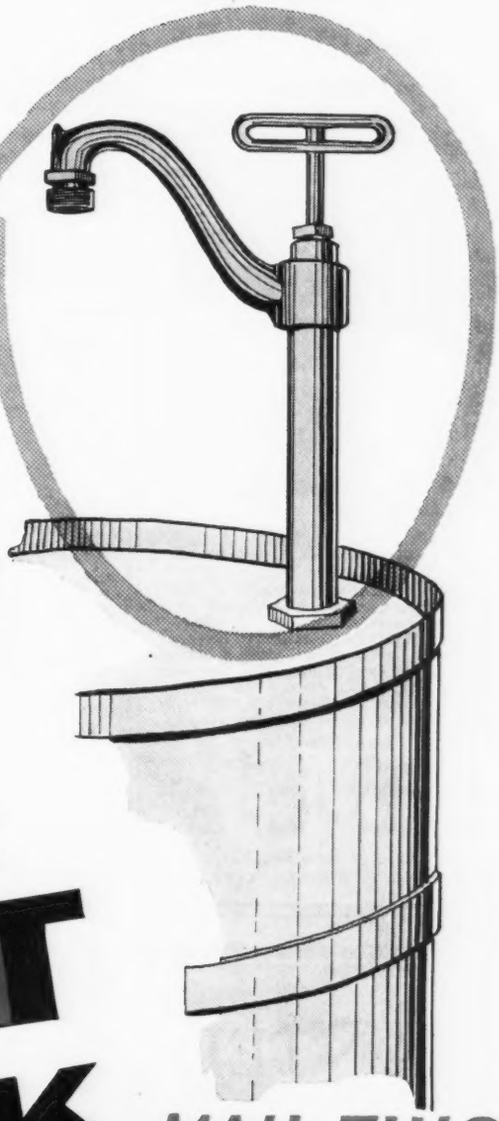

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Petroleum SALES Executive

Large Southwestern refinery, marketing its own brand, has exceptional opening for man of personality and qualities of leadership. Must be executive type, widely experienced in every phase of marketing through bulk and retail service stations and franchise jobbers. Salary attractive and possibilities unlimited.

Replies confidential—our organization knows about this ad.

BOX 517
National Petroleum News

ON THE LAZY BENCH

National Petroleum News

Careless Cut-ups

An Irishman, coming out of the ether in the ward after an operation, exclaimed: "Thank God! That' over!"

"Don't be too sure," said the man in the next bed. "They left a sponge in me and had to cut me open again." Then the patient on the other side added, "Why, they had to cut me open, too. They lost one of their instruments."

Just then the surgeon who had operated on the Irishman stuck his head in the door and yelled: "Has anybody seen my hat?"

Pat fainted.

—The Gas Line

* * *

"Does the defendant understand what an alibi is?"

"Yassah! Dat's provin' dat you was at a pra-r-meetin' whar yo' wasn't, in ordah to show dat you wasn't at a crap-game whar' yo' was."

—Magnolia Oil News

* * *

A Scotchman was seen dragging an alligator up the main street of his town, after a winter on the Florida golf courses.

"What's the idea?" a friend asked him.

"The son of a gun has my ball," he replied.

—Barnsdall

* * *

Rastus Did

Judge: "Well, here you are again, Rastus."

Rastus: "Yessah, boss, I'se back here afore you again, but dis time ah has a cause."

Judge: "Well, what is it, Rastus?"

Rastus: "Judge, what would you do if someone steal you wife?"

Judge: "I'd cut her company, Rastus, and let it go at that."

Rastus: "Dat's jes' what ah did—and ah cut him deep."

—The Gas Line

* * *

Her Donation

"Please, madam, would you give us a donation for the Inebriates' home?"

"Sure, come around tonight and get my husband."

—Magnolia Oil News

* * *

(Scratching): "How did you get rid of cooties?"

'That's easy. Take a bath in sand and rub down in alcohol. The cooties get drunk and kill each other throwing rocks."

—Barnsdall

Army Meets It Here

The New York World tells this one of the comparative safety of wild South America, as compared with so-called civilized North America:

A freight car loaded with three and a half million dollars worth of $20 gold pieces was shipped from La Paz, Bolivia, to the small seacoast town of Arica, a distance of some 300 miles.

When Capt. Parker's ship, the Santa Maria, called at the port, he was met by a representative of the steamship company, who mentioned that a shipment of gold had arrived from La Paz to be loaded aboard the Santa Maria. Just a matter of $3,570,000 cooling itself on the railroad siding.

"I looked to see where the guards were," said Capt. Parker, of civilized North America. "But the agent merely said: 'We don't need any guards. The shipment came to us in a freight car with only one guard, all the way from La Paz.' "

When the shipment arrived in New York recently, it was greeted by one fleet of armored trucks and one smaller sized army of armed guards.

* * *

An Irishman lay dying when the odor of cooking assailed his nostrils. Summoning his weeping daughter to his bedside, he said:

"Nora, darlin', ain't it biled ham that I smell?"

"Right for ye, faither," the girl replied.

"And would ye asking your mither if I can have one before I die?"

The daughter delivered the message to mother in the kitchen and brought back this answer:

"Mither says ye cannot have any of the biled ham; it's fer the wake."

—Magnolia Oil News

* * *

A Promise

Art Shires: "I feel sorry for you. I was born with boxing gloves on my hands."

Hack Nelson: "Yeah? Well, you're goin' to die the same way."

—The Gas Line

* * *

"We had a wonderful trip. We saw snow-crested summits leaping toward the cerulean heavens; we saw foaming torrents raging through the bottoms of shadowy canyons; we looked down from the beetling crags into the depths of limpid lakes—"

"How many miles to the gallon did you get?"

—Magnolia Oil News

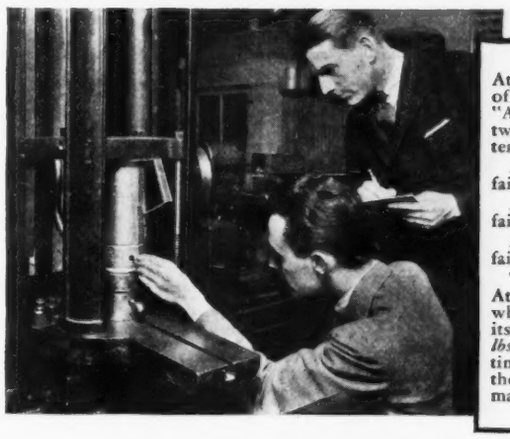
New Stations Building

Note: Material used in this column is principally taken from the newspapers. NATIONAL PETROLEUM NEWS assumes no responsibility for its accuracy.

The list as published from week to week cannot be looked upon as indicative of the relative extent to which stations are being built in various parts of the country.

Goodland, Kans.—Alva Shahan, filling station.
Manchester, Ia.—Sinclair Oil Co., service station.
Granada, Minn.—H. C. Wolter, filling station.
Center City, Minn.—Ernest Johnson, filling station.
Hebron, Wis.—Fred Ewins, filling station.
Fergus Falls, Minn.—Cities Service Oil Co., filling station.
Fergus Falls, Minn.—The Texas Co., filling station.
St. Joseph, Mo.—W. H. Dougan, service station.
Abbeyville, La.—Louisiana Oil Refining Co., filling station.
Baltimore, Md.—N. Wonderstock, service station.
Sedalia, Mo.—Mid-Continent Petroleum Corp., filling station.
Fort Towson, Okla.—W. A. Sizemore, filling station.
Brownwood, Tex.—Humble Oil & Refining Co., filling station.
Princeton, Mo. — Mid-Continent Petroleum Corp., service station.
Salina, Kans.—Henry Bruening Motor Co., service station.
McCrory, Ark.—Walter Jimerson, service station.
Talmage, Neb.—Farmers Co-Operative Oil Co., filling station.
Fargo, N. D.—Van Lith Bros., service station.
Minneapolis, Minn.—Standard Oil Co., service station.
Cedar Rapids, Ia.—Goodrich Silvertown Inc., service station.
Great Falls, Mont.—Richfield Oil Co., service stations.
Johnson, Kans.—White Eagle Oil & Refining Co., filling station.
Oak Ridge, Kans.—Frank Walters, filling station.
Beaumont, Tex.—Humble Oil & Refining Co., filling station.
Decorah, Ia.—H. Vangsness, filling station.
Sioux Falls, S. D.—Gasoline Alley Service Stations, filling station.
Minneapolis, Minn.—Pure Oil Co., filling station.
Rapid City, S. D.—Gasoline Alley Service Station, service station.
Cincinnati, O.—Standard Oil Co., service station.
Beaver, O.—Sun Oil Co., bulk station.
Marion, O.—The Texas Co., filling station.
Georgetown, O.—Cities Service Oil Co., service stations.
Coldwater, O.—W. P. Dock, filling station.
Belle Plaine, Ia.—Cities Service Oil Co., filling station.
Manchester, Ia.—Sinclair Refining Co., service station.
Sandusky, O.—Refiners' Oil Co., filling station.
Charles City, Ia.—Shell Petroleum Corp., service station.
Pipestone, Minn.—The Ressmeyer Oil Co., service station.
Massillon, O.—Red Raven Oil Co., filling station.
Roxbury, Mass.—Metropolitan Filling Stations, Inc., filling station.
Houston, Tex.—T. A. Lambright, filling station.
Jonesboro, Ark.—Phillips Petroleum Co., filling station.
St. Peter, Minn.—Sam Hangdahl, filling station.
Mankato, Minn.—H. C. Gerlach & Co., filling station.
Eau Claire, Wis.—E. J. Hancock, service station.
McGehee, Ark.—Howard Wolchansky, service station.
Beaumont, Tex.—Cities Service Oil Co., filling stations.
Roxborough, Pa.—Standard Oil Co. of Pennsylvania, filling station.
Findlay, O.—A. Dantico, service station.
Pittsburgh, Pa.—Standard Oil Co. of Pennsylvania, service station.
Dumont, Ia.—Frank Wagoner, filling station.
Morrison, Ia.—H. C. Buffington, service station.
Audubon, Ia.—Standard Oil Co., filling station.
Lawrence, Kans.—Standard Oil Co., filling station.

1500 POUNDS
. . . READS THE DIAL . . .
and Brookins wins over two other measures in University Compression Test



At the Mechanical Testing Laboratories of the University of Dayton, a Brookins "All-in-one" Measure was tested with two other makes of similar design, to determine their relative crushing strength.

Measure No. 1 showed first sign of failure at 1060 lbs.

Measure No. 2 showed first sign of failure at 1160 lbs.

Measure No. 3 showed first sign of failure at 1500 lbs.

"No. 3" was the Brookins Measure. At 1500 lbs. it showed rim failure only, whereas "No. 2", for example, spread its seams and failed completely at *1400 lbs.* The load on the Brookins was continued up to *2660 lbs.* before the body of the measure became distorted enough to make it illegal for use as a measure.

A previous "Shock Test" proved that six big men couldn't crush a Brookins Measure. So we wondered exactly how *much* pressure it would stand.

And to make the test even fairer, we took along two other measures, of similar design, made by other concerns. Then we put the three measures through a series of merciless Compression Tests.

The official test results—recorded by the Civil Engineering Department of the University of Dayton—prove once more that Brookins is the sturdiest equipment built . . . worth much more than the trifling difference in price that you may have to pay. Brookins Measures will out-last and out-wear all other measures on the market.

If you want to be *sure* of getting the oil measure that stands up under the "Shock Tests" of daily use, ask your jobber salesman for a Brookins. In the meantime, write us for descriptive literature.

THE BROOKINS MANUFACTURING COMPANY
726 Hawthorne Street, Dayton, Ohio

Brookins
SERVICE STATION EQUIPMENT

O-9

"AN HONEST MEASURE FOR HONEST OIL"

Luxury of a "Home Copy"

"A GOOD easy chair, my well-worn slippers, my old pipe and my weekly copy of NATIONAL PETROLEUM NEWS—is a genuine luxury, and I look forward to it every week with pleasure and profit."

These words of a veteran oil man in Pennsylvania carry a good suggestion to every man who depends on the "office copy" of National Petroleum News to keep abreast of the happenings in the oil industry.

A "home copy" of National Petroleum News is a touch of luxury and convenience you will enjoy and profit by. And the small sum of $3.50 will bring you this luxury, convenience, enjoyment and profit each week for a year. Send for it today.

Use the coupon below!

NATIONAL PETROLEUM NEWS
818 Penton Bldg., Cleveland, Ohio

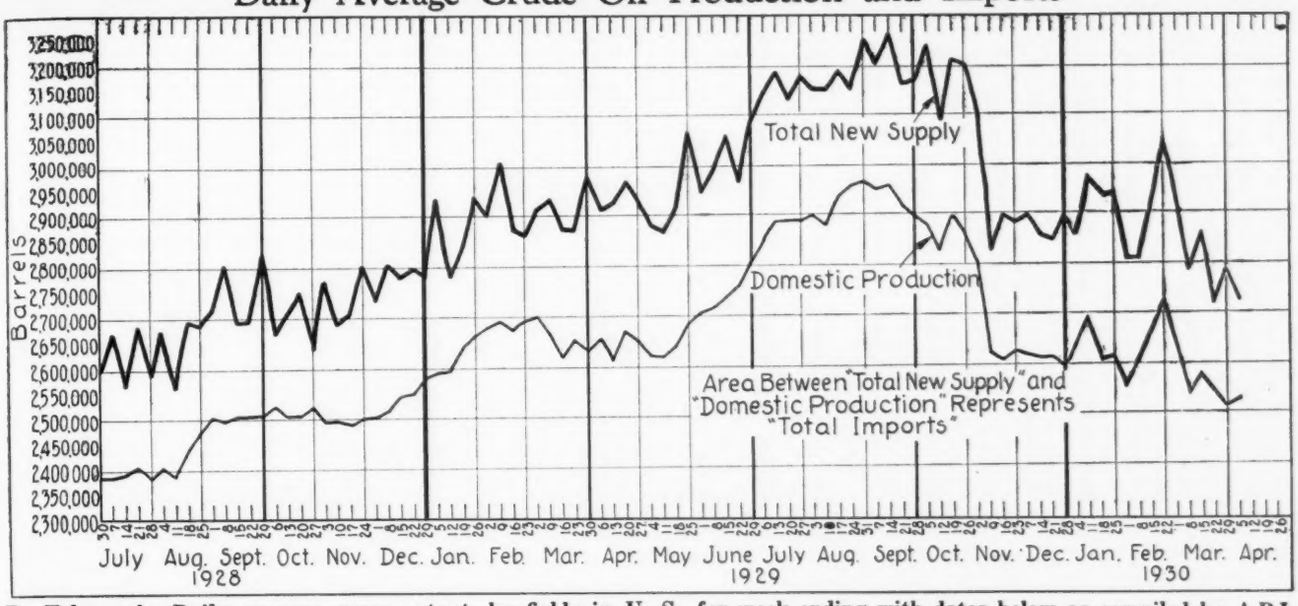
The luxury of a "home copy" appeals to me. Send the next 52 issues of National Petroleum News to the address below. Enclosed is $3.50 (Foreign $5).

NAME.....

Address.....City.....

Company.....Div. of Industry.....

Daily Average Crude Oil Production and Imports



By Telegraph—Daily average gross output, by fields in U. S., for week ending with dates below as compiled by A.P.I.

PRODUCTION SUMMARY	Apr. 5	March 29
Production east of Rockies	1,909,750	1,883,200
Increase		26,550
Total production in U. S.	2,530,450	2,514,200
Increase		16,250
Crude oil imports	201,285	*175,570
Increase		25,715
Total new crude supply	2,731,735	*2,689,770
Increase		41,965

*Revised. Imports figure formerly included imports of both crude and refined oils but beginning with March 29, it includes only crude oil imports.

OKLAHOMA	Apr. 5	Mar. 29
Allen Dome	19,750	20,150
Asher	2,250	2,250
Blackwell	3,350	3,350
Bowlegs	18,900	19,800
Braman	3,450	3,500
Bristow-Slick	16,150	16,250
Burbank	16,400	16,300
Carr City	8,950	9,350
Cromwell	7,600	7,400
Cushing	14,300	14,350
Davenport	1,150	1,150
Duncan District	7,300	7,300
Earlsboro	32,050	35,100
East Earlsboro	39,000	35,300
Fox	1,300	1,200
Garber	4,550	4,600
Graham	3,550	3,500
Healdton	11,950	12,000
Hewitt	7,250	7,200
Hubbard	1,600	1,600
Konawa	8,900	8,000
Little River	39,500	42,000
Little River, East	17,900	13,750
Logan County	8,200	8,450
Maud	6,050	7,000
Mission	10,150	12,550
North Okmulgee	10,900	10,900
Oklahoma City	95,800	73,900
Osage (Outside Burbank)	26,600	26,600
Papoose	2,950	2,800
Pearson	650	600
Sasakwa	14,050	11,500
St. Louis	38,150	39,300
Scholen-Alechem	13,400	13,350
Searight	11,050	10,600
Seminole	18,300	19,950
Seminole, East	3,000	3,700
South Okmulgee	6,350	6,350
Thomas	650	650
Tonkawa	7,800	7,800
Wewoka	3,750	3,950
Yale-Jennings	9,850	9,800
Others	60,850	59,850
Total, Oklahoma	635,600	615,000
Increase		20,600

KANSAS		
Augusta-Fox Bush	2,900	2,900
Churchill	4,450	4,400
El Dorado-Towanda	13,450	13,450
Florence-Covert	800	800
Greenwood County	19,000	19,000
Oxford	2,700	2,800
Peabody-Elbing	3,300	3,350
Rainbow Bend	1,100	1,050
Russell	3,400	3,450
Sedgwick County	20,850	21,050
Voshell	13,100	9,250
Others	32,500	33,000
Total, Kansas	117,550	114,500
Increase		3,050

NORTH LOUISIANA		
Bellevue	.....	650
Caddo, light	9,950	10,000
Caddo, heavy	2,600	2,700
Cotton Valley	2,300	2,300
De Soto and Red River	3,150	3,100
Elm Grove	.....	450
Haynesville	4,600	4,600
Holly	1,300	.....
Homer	3,600	3,600
Pleasant Hill	.....	750
Sarepta Carterville	4,250	.....
Urania	5,300	5,350
Zwolle	4,700	3,850
Others	1,950	5,850
Total, North Louisiana	43,700	43,300
Increase		400

ARKANSAS		
Champagnolle	4,800	4,900
El Dorado	3,950	4,000
Lisbon	1,000	1,050
Nevada	1,000	1,100
Smackover, light	5,250	5,300
Smackover, heavy	40,550	41,100
Stephens	950	950
Others	250	250
Total, Arkansas	57,750	58,600
Decrease		850

TEXAS (OUTSIDE GULF COAST)		
Panhandle District		
Carson County	9,450	9,850
Gray County	57,900	56,400
Hutchinson County	22,250	22,600
Wheeler County	800	450
Others	600	600
Total, Panhandle Texas	91,000	89,900
Increase		1,100
North Texas		
Archer County	17,500	17,600
Burkburnett	8,050	8,100
Electra	11,300	11,300
Iowa Park and K. M. A.	5,200	5,100
Montague-Cooke	10,750	10,500
Wilbarger	25,050	25,850
Others	2,200	2,000
Total, North Texas	80,050	80,450
Decrease		400
West Central Texas		
Brown County	7,700	7,750
Callahan County	3,700	3,700
Coleman County	4,700	4,800
Eastland-Desdemona	5,550	5,500
Jack County	4,100	4,100
Palo Pinto County	700	750
Shackleford County	6,600	6,600
Stephens County	5,850	5,850
Throckmorton County	850	900
Young County	10,000	9,800
Others	1,400	1,400
Total, West Central Texas	51,150	51,150
West Texas		
Crane and Upton Counties	46,000	46,400
Crocket County	2,100	2,200
Ector County	4,500	4,000
Howard County	39,250	39,700
Jones County	2,100	2,100
Mitchell and Scurry Counties	2,300	2,300
Reagan County	16,500	16,700
Winkler County	85,000	86,250
Yates	111,250	113,900
Balance Pecos County	5,500	5,600
Others	2,700	2,850
Total, West Texas	317,200	322,000
Decrease		4,800

East Central Texas	Apr. 5	Mar. 29
Boggy Creek	3,300	3,450
Corsicana-Powell	5,900	6,000
Currie	300	300
Mexia	4,000	4,100
Nigger Creek	200	200
Richland	250	250
Van Zandt	16,100	10,200
Wortham	850	900
Total, East Central Texas	30,900	25,400
Increase		5,500

Southwest Texas		
Dale	300	300
Darst Creek	15,000	15,500
Laredo District	8,500	8,600
Luling	9,900	10,000
Lytton Springs	900	900
Salt Flat	22,050	22,150
Somerset	1,300	1,350
Others	2,100	2,200
Total, Southwest Texas	60,050	61,000
Decrease		950
Total, Texas (outside Gulf Coast)	630,350	629,900
Increase		450

GULF COAST		
Coastal Texas	Apr. 5	Mar. 29
Barbers Hill	28,850	27,800
Batson	1,200	1,200
Big Creek	3,150	2,700
Blue Ridge	2,000	1,800
Boling	1,150	1,000
Damon Mound	600	500
Esperson	4,500	.....
Fannett	1,200	1,300
Goose Creek	5,050	5,000
Hull	8,900	9,100
Humble	20,300	19,100
North Dayton	1,000	800
Orange County	2,300	2,500
Pierce Junction	12,650	11,000
Port Neches	2,200	2,300
Raccoon Bend	10,300	10,250
Refugio County	40,100	43,950
Saratoga	1,050	1,050
Somerville	1,800	1,650
Sour Lake	2,250	2,250
South Liberty	4,650	5,200
Spindletop	15,300	16,350
Sugarland	10,500	10,150
West Columbia	5,900	6,050
Others	5,800	10,650
Total, Coastal Texas	192,700	193,650
Decrease		950

Coastal Louisiana	Apr. 5	Mar. 29
East Hackberry	1,450	1,200
Old Hackberry	1,200	1,200
Edgerly	500	550
Evangeline	900	1,100
Lake Barre	1,500	.....
Lockport	2,800	2,800
Port Barre	2,000	1,400
Sorrento Dome	.....	100
Sulphur Dome	3,150	3,350
Vinton	4,100	4,050
Others	2,400	4,750
Total, Coastal Louisiana	20,000	20,500
Decrease		500
Total, Gulf Coast	212,700	214,150
Decrease		1,450

ROCKY MOUNTAIN		
Wyoming	Apr. 5	Mar. 29
Big Muddy	2,050	2,050
Elk Basin	800	800
Grass Creek	2,200	2,000
Labarge	2,400	1,900
Lance Creek	150	150
Lost Soldier	3,100	2,950
Oregon Basin	4,700	4,800
Rock River	2,200	2,200
Salt Creek	31,500	30,300
Others	4,000	3,700
Total, Wyoming	53,100	50,850
Increase		2,250
Montana		
Cat Creek	1,200	1,200
Pondera	1,750	2,050
Sunburst	6,000	6,000
Others	50	50
Total, Montana	9,000	9,300
Decrease		300
Colorado		
Florence	650	650
Fort Collins	1,450	1,400
Moffat (Craig)	1,050	1,100
Others	1,450	1,600
Total, Colorado	4,600	4,750
Decrease		150
New Mexico		
Artesia	800	800
Balance Lea and Eddy Counties	7,800	7,900
Hogback	450	450
Rattlesnake	450	800
Table Mesa	100	100
Others	950	950
Total, New Mexico	10,550	11,000
Decrease		450
Total, Rocky Mountain	77,250	75,900
Increase		1,350

CALIFORNIA	Apr. 5	Mar. 29
Dominguez	9,500	8,500
Elwood-Goleta	40,800	39,400
Huntington Beach	28,700	30,000
Inglewood	18,000	17,700
Kettleman Hills	12,200	12,500
Long Beach	99,500	102,500
Midway-Sunset	72,500	74,500
Santa Fe Springs	125,500	135,000
Seal Beach	24,500	24,000
Ventura Avenue	43,500	44,000
Others	143,000	143,000
Total, California	620,700	631,100
Decrease		10,400

EASTERN		
(Not including Michigan)	122,500	120,000
Increase		2,500

MICHIGAN		
Mt. Pleasant	6,950	6,400
Muskegon	5,150	5,100
Saginaw	250	250
Total Michigan	12,350	11,750
Increase		600

Compilation Of Mid-Continent Refinery Operations

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Mid-Continent Refinery Operations Week Ended April 4 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	West Texas	North La.-Ark.	Total Week Ended Apr. 4
Plants Reporting	12	29	25	15	12	93
Da. Av. Cap. (Bbls.)	94,500	161,700	106,100	82,000	77,000	521,300
Da. Cracking Capacity	30,700	52,600	17,200	5,000	22,700	128,200
Da. Av. Crude Runs	65,621 — 10.1	113,205 — 2.6	62,987 — 4.3	39,379 — 10.7	63,025 + 8.5	344,217 — 3.7
Da. Av. Other Oils	6,604 — 30.1	1,737 — 74.1	2,807 — 34.9	1,215 — 14.2	1,954 — 30.6	14,317 — 42.1
GASOLINE—Gallons						
Stocks, Mar. 28	27,985,000	71,051,000	22,550,000	10,381,000	13,816,000	145,783,000
Prod. 3-28 to 4-4	11,117,000 — 14.1	16,491,000 — 7.3	8,733,000 + 5.7	3,581,000 — 6.0	5,838,000 + 4.6	45,760,000 — 5.4
Ship. 3-28 to 4-4	12,373,000 — 2.6	19,063,000 — 0.7	8,134,000 — 6.3	3,119,000 — 28.9	5,643,000 + 1.9	48,332,000 — 4.3
Stocks, Apr. 4	26,729,000 — 4.5	68,479,000 — 3.6	23,149,000 + 2.7	10,843,000 + 4.5	14,011,000 + 1.4	143,211,000 — 1.8
Ratio Sales to Prod.	111.3%	115.6%	93.1%	87.1%	91.5%	105.6%
KEROSENE—Gallons						
Stocks, Mar. 28	7,835,000	6,465,000	2,455,000	21,000	2,730,000	19,506,000
Prod. 3-28 to 4-4	2,123,000 — 15.4	2,360,000 + 2.4	1,477,000 — 6.9	30,000	533,000 + 27.8	6,523,000 — 4.3
Ship. 3-28 to 4-4	2,340,000 — 15.3	1,969,000 — 2.8	1,260,000 — 7.8	—9,000	529,000 + 30.0	6,089,000 — 7.4
Stocks, Apr. 4	7,618,000 — 2.8	6,856,000 + 6.0	2,672,000 + 8.8	60,000 +185.7	2,734,000 + 0.1	19,940,000 + 2.2
Ratio Sales to Prod.	110.2%	83.4%	85.3%	.....	99.2%	93.3%
STOVE DISTILLATE—Gallons						
Stocks, Mar. 28	2,724,000	3,393,000	379,000	183,000	133,000	6,812,000
Prod. 3-28 to 4-4	340,000 — 27.0	546,000 — 18.8	132,000 — 9.6	147,000 + 31.2	169,000 — 20.7	1,334,000 — 17.1
Ship. 3-28 to 4-4	293,000 — 44.5	794,000 + 20.7	314,000 — 2.8	94,000 — 35.6	256,000 + 61.0	1,751,000 — 3.5
Stocks, Apr. 4	2,771,000 + 1.7	3,145,000 — 7.3	197,000 — 48.0	236,000 + 29.0	46,000 — 65.4	6,395,000 — 6.1
Ratio Sales to Prod.	86.2%	145.4%	237.9%	63.9%	151.4%	131.3%
GAS OIL—Gallons						
Stocks, Mar. 28	5,785,000	41,004,000	2,695,000	4,868,000	7,901,000	62,253,000
Prod. 3-28 to 4-4	1,379,000 — 18.8	4,167,000 + 89.8	880,000 — 38.4	613,000 — 3.6	2,053,000 — 13.5	9,092,000 + 9.1
Ship. 3-28 to 4-4	952,000 + 3.5	3,039,000 +204.8	1,033,000 — 35.8	719,000 + 6.7	1,557,000 — 26.7	7,300,000 + 15.4
Stocks, Apr. 4	6,212,000 + 7.4	42,132,000 + 2.8	2,542,000 — 5.7	4,762,000 — 2.2	8,397,000 + 6.3	64,045,000 + 2.9
Ratio Sales to Prod.	69.0%	72.9%	117.4%	117.3%	75.8%	80.3%
FUEL OIL—Gallons						
Stocks, Mar. 28	14,692,000	31,304,000	65,803,000	12,899,000	24,932,000	149,630,000
Prod. 3-28 to 4-4	4,676,000 — 20.0	6,320,000 — 15.5	7,616,000 — 4.9	5,916,000 — 10.9	5,514,000 + 7.0	30,042,000 + 9.3
Ship. 3-28 to 4-4	5,468,000 — 12.6	7,887,000 + 30.3	10,988,000 + 68.6	5,364,000 — 11.6	5,697,000 + 0.4	35,404,000 +15.8
Stocks, Apr. 4	13,900,000 — 5.4	29,737,000 — 5.0	62,431,000 — 5.1	13,451,000 + 4.3	24,749,000 — 0.7	144,268,000 — 3.6
Ratio Sales to Prod.	116.9%	124.8%	144.3%	90.7%	103.3%	117.8%

Gasoline Produced by Various Methods, Week Ended April 4

	Kansas	% of Total	Oklahoma	% of Total	North & Cent. Texas	% of Total	West Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	6,781,000	61.0	11,289,000	68.5	5,463,000	62.6	3,262,000	91.1	2,282,000	39.1	29,077,000	63.5
Cracked	3,438,000	30.9	3,766,000	22.8	1,961,000	22.5	105,000	2.9	2,811,000	48.2	12,081,000	26.4
Natural	898,000	8.1	1,436,000	8.7	1,309,000	14.9	214,000	6.0	745,000	12.7	4,602,000	10.1
Total	11,117,000		16,491,000		8,733,000		3,581,000		5,838,000		45,760,000	

+ or — columns are % change over previous week.

Gasoline Drafts Continue as Output Is Curtailed

Staff Special—By Telegraph
TULSA, April 8

CRUDE oil runs to stills at Mid-Continent refineries that report statistics of their operations weekly to NATIONAL PETROLEUM NEWS, were reduced 13,000 barrels daily average in the week ended April 4. Reductions were made in all districts except Louisiana-Arkansas where runs were increased 8.5 per cent.

The crude run reduction caused a fall of 2,700,000 gallons in gasoline production. Gasoline shipments were 2,000,000 gallons less than in the preceding week but stocks were lowered 2,500,000 gallons in the whole field when stocks in Oklahoma and Kansas were drawn on heavily.

Gasoline stocks April 4 were 143,211,000 gallons, or only 2,500,000 gallons more than on April 2, 1929.

Kerosene stocks were increased

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended April 4. Change in stocks figures from March 7.

GASOLINE

	Gallons
Production	185,359,000
Shipments	200,839,000
Net change in stocks	—15,480,000
Ratio sales to production	108.4%

KEROSENE

Production	26,508,000
Shipments	28,233,000
Net change in stocks	—1,725,000
Ratio sales to production	106.5%

STOCK DISTILLATE

Production	6,057,000
Shipments	7,173,000
Net change in stocks	—1,116,000
Ratio sales to production	118.4%

GAS OIL

Production	33,945,000
Shipments	25,179,000
Net change in stocks	+8,766,000
Ratio sales to production	74.2%

FUEL OIL

Production	127,684,000
Shipments	132,216,000
Net change in stocks	4,532,000
Ratio sales to production	103.5%

440,000 gallons with both shipments and production less than in the preceding week.

The cold wave in the middle west caused a 400,000-gallon draft on distillate stocks. Refiners were curtailing production.

Gas oil stocks were increased 1,800,000 gallons with both production and shipments larger than the week before. Fuel oil stocks were reduced 5,500,000 gallons, each district except West Texas drawing on reserves.

Continental Expanding Marketing Facilities

HOUSTON, April 3.—Active extension of its distributing facilities in Texas was announced by the Continental Oil Co., April 2, when it made known that a $500,000 construction program for Dallas territory would include a bulk distributing plant and seven new filling stations to be erected at once. An additional half dozen stations, it was said, would be built at individual costs of $12,000 to $15,000 in the next year.

The bulk plant, to be constructed on a six acre site on the Eagle Ford road in West Dallas, is in the Trinity River industrial district facing the Texas & Pacific railroad tracks. Including equipment, it is estimated the plant will cost $75,000.

Holland-Martin Oil Co., of Dallas and Fort Worth, will represent the Continental in Dallas territory, with Albert Martin in charge of its affairs.

Announcement of expansion plans was made in connection with a visit to Dallas of Continental executives, including D. J. Moran, Ponca City, president; T. S. Lamont, director, New York; W. W. Bruce, Ponca City, executive vice president; Ernest J. Nicklos, Ponca City, production vice president; Walter Miller, Ponca City, manufacturing vice president; E. S. Karstedt, Ponca City, marketing vice president; Harry J. Kennedy, general sales manager; Frank Moore, Special sales representative; and Richard Jackson, transportation manager.

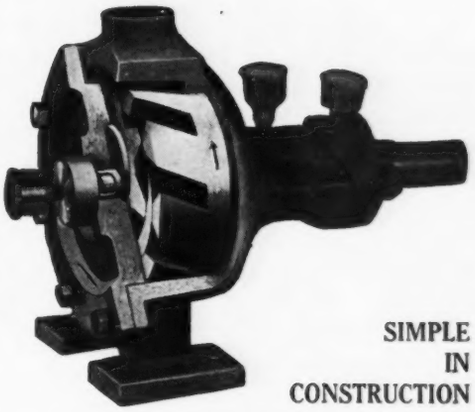
Marketing Division Is Added

LOS ANGELES, April 4.—A petroleum division for oil field equipment advertising has been added to Emil Brisacher and Staff, advertising engineers, with headquarters here and offices at San Francisco, Portland, Chicago, New York, London and Paris.

C. L. McCorkindale, for the past 10 years connected with the California oil industry is in charge of this division. In addition to being in the production departments of the Petroleum Midway Co. and the California Petroleum Corp., Mr. McCorkindale has been writing technical field articles, and has been a publicity editor and advertising manager.

LIKE A PAIR OF SCISSORS

The teeth on the rotor of the Perfection Rotary Pump work like a pair of scissors. They cut on an angle and slice the stream of liquid passing through the pump instead of splashing into it head on. There is no shock . . . no strain . . . no vibration. The Perfection Rotary Pump runs smoothly and delivers a uniform flow.

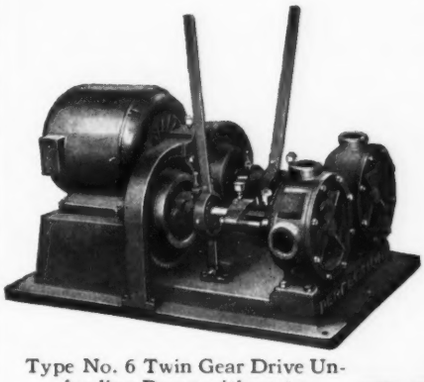


SIMPLE IN CONSTRUCTION

Because the pressure of the liquid passing through the pump is balanced evenly with the end-thrust of the helical gears, the Perfection Rotary Pump operates with minimum wear.

Perfection Rotary Pumps are surprisingly simple in construction.

There are only two moving parts . . . the helical rotor and internal helical pinion. The intermeshing teeth of the rotor and pinion work like a series of pistons in cylinders. The Perfection Rotary Pump is the only one on the market with helical gears. They have long been recognized by the engineering profession as preferable to straight gears for power transmission. Write today for complete information.



Type No. 6 Twin Gear Drive Unloading Pump with motor

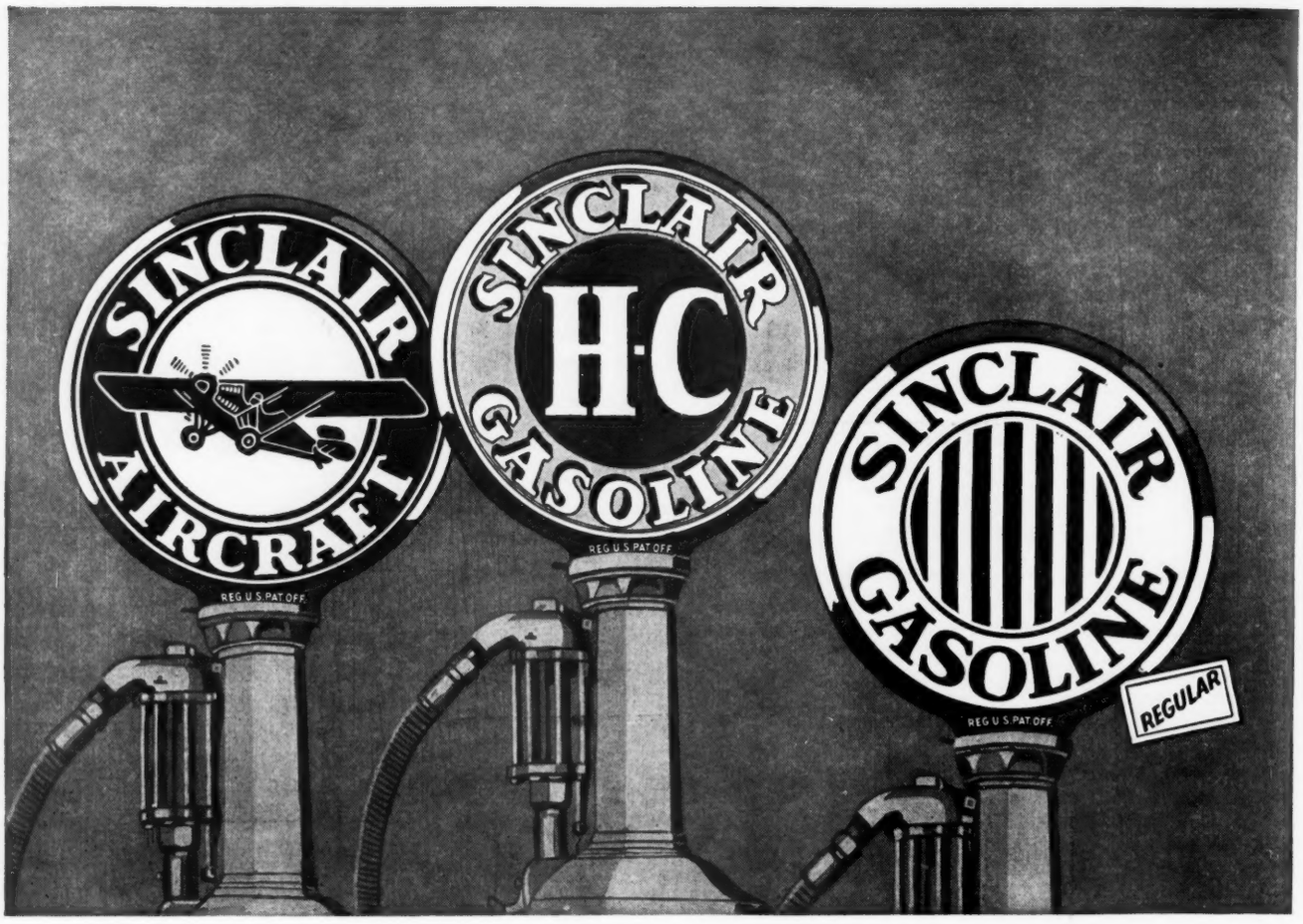
Perfection Manufacturing Co.
2194 East Hennepin Ave., Minneapolis, Minn.

PERFECTION ROTARY PUMP

Advertising Manager Wanted

We want a man with experience in the preparation of advertising layout and copy, a thorough grasp of sales promotion, and a fundamental working knowledge of petroleum marketing. Substantial starting salary and brilliant future for the man who can qualify. Give full details in first letter. Replies strictly confidential.

Address Box 516, National Petroleum News



Here's the new way to sell gasoline . . . the *sure way* to increase your gallonage . . .

SINCLAIR THREE-GAS SERVICE

Today, with so many different engines on the road and so many different motoring conditions everywhere, no one kind of gasoline can be best for all engines. Today, it takes three different *kinds* to meet all demands—and you can satisfy these three demands with Sinclair Three Gas Service.

Here are the three kinds of gasolines for all the different motoring needs.

For the motorist who wants quick starting, zooming acceleration, flashy stop-and-go action in traffic, with brilliant performance along the highway, here's Sinclair Aircraft Gasoline, the *Ace* of high test gasolines. Sinclair Aircraft is the Ace of high test gasolines because it is specially manufactured at Sinclair Refineries, meeting the requirements of the Federal Specifications Board for Aviation Gasoline—domestic grade—and gives sustained power. Due to its careful fractionation it is free from dissolved gases which cause gas locks, uneven distribution, galloping and engine balk.

Or if a customer wants high-compression performance, who wants to stop knocks and take the hills in high—without a complaint from the engine, here's H-C Gasoline, *all* gasoline—nothing added.

And if he prefers to pay three cents less per gallon, here's Sinclair Regular Gasoline full of eager power—full, too, of economy and mileage. The quality gasoline at a popular price.

They're *all* gasoline—nothing added—and they are three remarkable fuels! Let your customers *select* their gasoline from Sinclair Three-Gas Service—you'll get their business and keep it!

SINCLAIR REFINING COMPANY, INC.
45 Nassau Street, New York
Atlanta, Chicago, Houston, Kansas City

Refinery - Tank Wagon Markets

National Petroleum News

Seaboard Areas Prominent Exceptions In Advancing Gasoline Markets

CLEVELAND, April 8

TANK car gasoline prices continued to push forward in the majority of refining districts last week. Markets on both the Atlantic and Pacific seaboards still stood out as notable exceptions to the upward movement due largely to retail price wars in their immediate distributing territories.

With the continued improvement in gasoline prices in the Mid-Continent, other oils in this district joined in and recorded slight price advances. Elsewhere, however, nominal demand held back both light and heavy burning oil prices.

Sentiment regarding the likelihood of an advance in Mid-Continent crude oil prices in the near future gained considerable headway. This factor was credited with causing the greater activity on the part of middle western jobbers in the gasoline market, although increased consumption was said to have accounted for some of the rush shipment buying.

Gasoline prices in practically every section of the Mid-Continent advanced 0.125 to 0.375-cent a gallon. Reports from refiners in this area indicated that actual shipments were slightly under the previous week's level but a nice slice was cut from their stocks due to a curtailment of 2,700,000 gallons in production.

The retail price war on the Pacific coast continued unabated and little, if any, improvement was noted in the retail situation on the northern part of the Atlantic seaboard. Tank car gasoline prices showed further recessions in the former district and posted quotations in the latter area were being undersold more freely.

Demand for kerosene was reported increasing in practically all districts. In the Mid-Continent and in the Chicago district it was sufficient to cause slight price advances. In other districts, however, reports indicated that considerable surplus of stocks would have to be worked off before any improvement in prices could be expected.

Lubricating oil prices held their own. Exceptionally good demand for a few grades of neutral oil caused rather an acute scarcity of these grades to develop and prices advanced substantially.

Both foreign and domestic wax buyers, believing, according to reports, that prices were about on bottom, showed more of a disposition to buy ahead; inquiries were much more numerous in the New York market than they have been for some time past.

Export Inquiry Active

NEW YORK, April 8.—Inquiries from six foreign buyers for 12 cargoes of gasoline were received by Gulf suppliers on Monday, April 7. English buyers entered inquiries for five cargoes of 60-62, 400 e.p. gasoline and two cargoes of 61-63, 390 e.p. gasoline. French accounts sought five mixed cargoes of U. S. Motor and 64-66, 375 e.p. gasoline. Inquiries specified shipment over the next six months.

Chicago U. S. Motor Advances 0.25-Cent

Staff Special

CHICAGO, April 5

THE upward climb in spot gasoline prices, and the continued good demand for spot gasolines were outstanding events of the week ended April 5 in the Chicago resale market.

Spot prices of U. S. Motor gasoline continued to move upward slowly but steadily and the low of the price range, as shown in PLATT'S OILGRAM, was up 0.25-cent over the week. The price ranges on U. S. Motor during the week were: March 31, 6.25 to 6.50 cents; April 1, 2 and 3, 6.375 to 6.50 cents; and 6.50 to 6.625 cents on April 5.

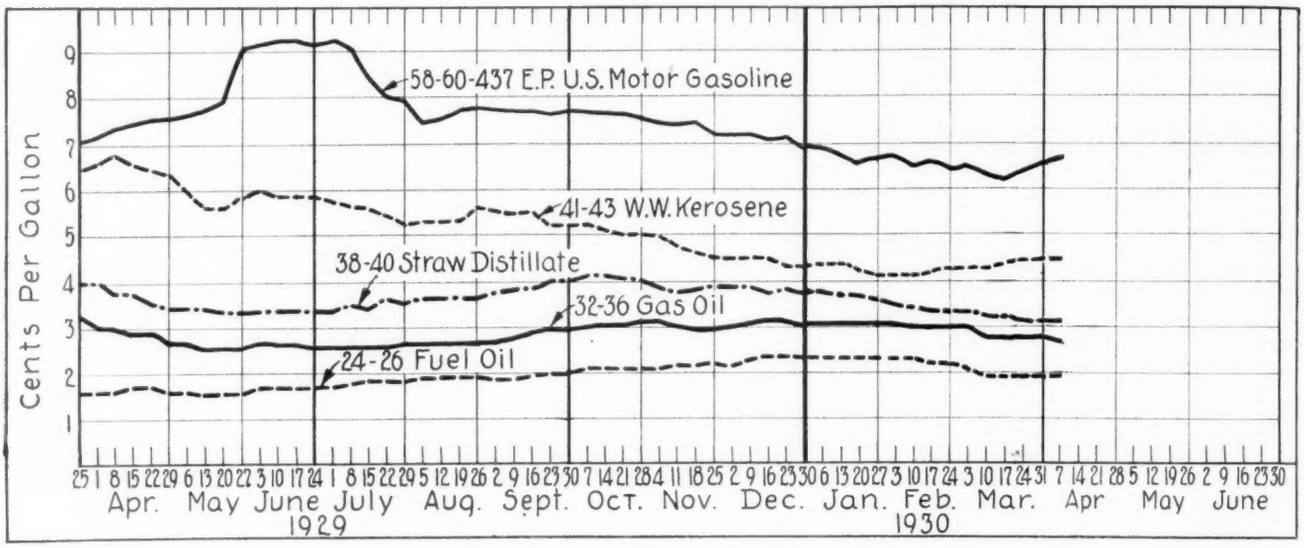
Practically all of the Chicago carlot marketers, who had sold U. S. Motor at 6.25 cents early in the week, reported there was hardly any full specification gasoline available under 6.50 cents on April 5. Buyers reported being offered an occasional car of U. S. Motor as low as 6.125 and 6.25 cents. As a general rule, this was goods which had been placed in transit by some marketer to keep the refiner from cancelling his order. However, there was not a large enough amount of gasoline available at these prices to be considered much of a factor in the market.

Most Chicago marketers reported their buying prices on U. S. Motor on April 5 were 6.50 cents in Oklahoma and 6.375 to 6.50 cents in North Texas and Louisiana. Two of them reported a little Oklahoma Motor offered at 6.375 cents for immediate shipment. One Illinois refiner, who had sold some U. S. Motor to carlot marketers for shipment the first week in April at 7.50 cents, f.o.b. refinery, was reported to be out of the market for the remainder of April. A marketer, who had purchased some of this gasoline, said he had already sold it at prices ranging from 6.25 cents and up, f.o.b. Group 3.

Most carlot marketers, especially those whose quotations were at the low of the market price range, reported a steady call for U. S. Motor gasoline for prompt shipment. A number of refiners, who quoted U. S. Motor at 6.625 cents early in the week and then raised to 6.75 cents, generally reported a light spot demand, but said their contract business was holding up in fine shape and that sales of gasoline through their own stations were at a high rate, for the season. A number of refiners who generally have gasoline to offer in the spot market reported they were sold up and out of the market until at least April 15.

Another item of considerable inter-

Current Prices of Principal Mid-Continent Refined Products


58-60-437 E.P. U.S. Motor Gasoline
41-43 W.W. Kerosene
38-40 Straw Distillate
32-36 Gas Oil
24-26 Fuel Oil
Cents Per Gallon
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr May June
1929
1930

Prices shown are in Group 3 basis and extended to date shown in Refinery Market Tables Section of this issue

est to the Chicago trade was what to quote on U. S. Motor gasoline for shipment over the remainder of April.

Refiners reported that both carlot marketers and jobbers were actively inquiring for gasoline for April shipment but that they were refusing to sell for other than prompt shipment. One Kansas refiner was reported to have sold a considerable quantity of U. S. Motor to resale agents for April delivery at 6.375 cents f.o.b. Group 3 and a number of marketers were long some Motor purchased during March, but most of them said they were not long any considerable amount of gasoline.

Demand for high gravity gasolines generally was quiet but prices were about 0.125-cent higher in line with the U. S. Motor grade. One Oklahoma refiner reported selling 10 cars of 60-62, 400 e.p. gasoline to a marketer at 6.875 cents for shipment between April 7 and 14.

A number of sellers reported an excellent demand for kerosenes last week. Others said they had enjoyed only a fair business. Sales of 41-43 generally were at the same level as the previous week, 4.25 to 4.50 cents, but several buyers reported they were being offered less kerosene at 4.25 cents. Several carlot marketers said they were unable to obtain any good kerosene for resale under 4.25 cents. One refiner said he had moved some 41-43 w.w. at 4.625 cents.

The heavy oil market continued comparatively inactive although there was little change reported in prices. One or two grades of fuel oil were fractionally lower but in general the situation was unchanged. Several resellers reported that refiners, who had formerly sold them U.G.I. gas oil at 2.25 cents, now were quoting at least 2.375 cents. A number of sellers reported that less 38-40 straw distillate was being offered under 3 cents.

Some precipitation is likely at the beginning and again at the end of next week in the Standard of Indiana territory, says the Chicago weather bureau. Temperatures probably will be moderate all week.

RICHMOND, Va.—A large real estate transaction was consummated here recently with the sale of the White Auto Sales Corp. property at Westhampton and Colonial Aves. to the Realty Investment Mortgage Co., for $100,000. This property is understood to be considered by two oil companies who plan to build a super service station there.

RICHMOND, Va.—Gasoline tax and automobile license fees netted the state of Virginia $7,430,545 the first three months of this year, an increase of $635,293 over a similar period last year.

Shipments From Southern California

LOS ANGELES, April 3.—Shipments of bulk petroleum from Southern California ports for week ended March 28 were as follows: (Barrels)

Destination	Crude	Gasoline	Diesel	Kerosene	Fuel	Gas-Oil	Total
Pacific For.	62,822	63,132	73,181	.....	271,282	.....	470,417
Atlantic Dom.	.....	368,971	.....	.....	.....	20,000	389,971
Atlantic For.	.....	238,473	.....	58,305	.....	.....	296,778
Total	62,822	670,576	73,181	58,305	271,282	20,000	1,157,166

Prices 10 Years Ago
April 5, 1920

	Oklahoma	Penna.
58-60 U. S. Motor.....	23.00c	24.00–24.50c
80-84 Natural	17.25–17.50c	.....
Kerosene (41-43 Okla.; 47 w. w. Pa.).....	11.50–12.50c	15.50–16.00c
Fuel Oil (24-26 Okla.; 38-40 Pa.)	$2.90–$3.25	13.00–13.25c
Crude (Okla. 35-35.9)....	$3.50	$6.10
Chicago tank wagon		25.00c

Prices A Year Ago
April 8, 1929

	Oklahoma	Penna.
58-60 U. S. Motor.....	7.3352c	9.00c
Grade A Natural	8.00c	.....
Kerosene (Okla. 41-43; Pa., 47 w. w.).....	6.75–6.875c	8.25–8.50c
Fuel Oil (Okla. 24-26; Pa. 36-40)	$0.675	5.25–5.50c
Crude (Okla. 35-35.9)	$1.17	$4.00
Chicago tank wagon		14.00c

Mid-Continent Refinery Markets

Activity Gains as Gasoline Prices Rise

Staff Special
TULSA, April 5

GASOLINES set the pace for activity in the Mid-Continent refinery market the first week of April. Prices advanced 0.125 to 0.375-cent in all districts, and the new price levels were firmly established at the close of business April 5.

The price range for 58-60 U. S. Motor in Oklahoma was 6.50 to 6.75 cents, with a majority of refiners quoting the higher figure at the end of the week. Marketers had a few cars of gasoline bought ahead which they moved at 6.375 to 6.50 cents, but in most instances the volume was either too small to be representative of the market, or the gasoline was off specification, or originated in some district outside of Oklahoma.

Refiners were cautious about quoting gasoline at a flat price for delivery over the month. On April 5 two or three marketers reported they had been unable to obtain any satisfactory gasoline for shipment by April 15 at less than 6.625 cents.

Kansas refiners early in the week advanced their U. S. Motor quotations to 6.75 cents, group 3 basis, and 7 cents, Kansas destination. The north Texas refiners were in excellent position due to export orders on their books, and domestic grades were comparatively scarce. Refiners in that district were able to move the bulk of their U. S. Motor within the state at 6.375 to 6.50 cents, and in an occasional instance at 6.625 cents. Virtually the same situation existed in Louisiana and Arkansas with reference to the domestic demand in differential territory.

A check of many of the smaller refiners revealed them to be in an excellent position as far as gasoline stocks were concerned. Many of them reported they were virtually scraping their tank bottoms, and the stocks they had on hand were in reality working stocks. They reported their shipments were keeping pace with production.

Several of the larger refiners with ample storage facilities put some of their production into storage for their retail divisions this summer.

There has been much speculation as to just where the gasoline being shipped out really was going, into storage or directly to the consumer. Many students of the market were inclined to believe there was considerable stocking of storage tanks being done even by the large companies. The sales manager for one large distributing company related to the writer the dispute his company's refining and marketing divisions had with reference to gasoline shipments in March.

The marketing division, he said, took out a million gallons more gasoline than it had estimated it would need. The refining division accused the marketing division of stocking up while prices were low. The marketing division denied the charge, and it "went to the mat." The marketing division proved its stocks had not increased in March, which meant that the gasoline consumption had been greater than anticipated.

Several other companies have related similar instances of increased consumption.

Natural gasolines snapped out of their usual first of the month lull late in the week and developed considerable activity, although no large buying was reported. Prices of the lower grades moved up slightly, and on April 5 one large manufacturer was in the market for a quantity of grade AA, offering 5.75 cents.

Natural gasoline stocks were in excellent shape and it was the general opinion of the trade that naturals will follow closely on the heels of the U. S. Motor market this spring.

Kerosene demand was exceptionally good in Kansas but lost some ground in Oklahoma and north Texas although prices remained unchanged. Many of the trade attributed the weakness of kerosenes in Louisiana to the slowing up of the market in the remainder of the Mid-Continent. Others attributed the lighter buying to weather conditions.

The kerosene situation apparently was more stable in Louisiana, however, due to the sale of 300,000 gallons for export early in the week, and another inquiry late in the week.

Two or three refiners making above the average distillate reported they were swamped with orders, but the remainder of refiners indicated business was comparatively dull throughout the week. The same applied to gas oil in Oklahoma, although buying increased in north Texas late in the week and prices showed a tendency to advance.

Fuel oils were exceptionally dull in all districts, and buying was light for future delivery. Even in the face of this situation, however, many sellers were of the opinion fuels would begin to show some improvement later in the summer.

Neutral oils were exceptionally active in Oklahoma. Manufacturers reported compounders and other refiners were swamping them with inquiries for both prompt and deferred delivery. The prevailing quotation for the most popular grade, 200 vis. No. 3 color oil, was 12 cents, but virtually all manufacturers of that grade reported they were completely sold up at present.

Bright stock was in light demand most manufacturers reported. Wax was dull with prices fractionally lower.

Texas City Refinery Reopened by Stone

HOUSTON, April 3.—The Stone Oil Co., headed by Robert W. Stone of Houston, has been incorporated for the lease and operation of the plant at Texas City formerly known as that of the Terminal Oil & Refining Co.

The plant, which includes one modern Jenkins still and topping equipment, has total daily crude capacity of 3000 barrels. It was started up at one half capacity, operating on light Coastal crude, making gasoline, motor spirits, furnace oil, gas and fuel oil.

Arrangements also have been made by the Stone Oil Co., for supplying Bunker "C" and Diesel grades at the Texas City and Galveston harbors.

Associated with Robert W. Stone in the company are his brother, Henry M. Stone, vice president and refinery manager; and Robert D. Breed, secretary-treasurer. Henry M. Stone was formerly plant manager for the Terminal Oil & Refining Co. Mr. Breed has been associated with Robert W. Stone in the marketing business the last two years. Previously they were together in the Freeport Asphalt Co. organization.

Offices of the Stone Oil Co. are maintained in the Second National Bank building at Houston.

Oil Safety Masks Approved By Bureau

PITTSBURGH, Pa.—The U. S. Bureau of Mines has approved the combination hose mask and canister for protection against acid gases and organic vapors for tank gaugers' masks made by the Mine Safety Appliances Co. here.

The M-S-A combination hose mask is used to enter high concentrations of gas or oxygen deficient atmosphere. It is used largely among oil and chemical companies.

The tank gaugers' mask provides protection against deadly hydrogen-sulfide gas from sour crudes and distillates encountered in oil company tanks.

Comparative Prices of 58-60 U. S. Motor Gasoline, 437 E. P., Group 3 and Point of Origin, to Jobbers Only

In Effect April 7

	Price F.O.B. Group 3		*Price F.O.B. Point of Origin*		*If for Particular Destination*
Oklahoma	6.7361	(Wt. Avg.)	6.7361	(Wt. Avg.)	.....
Kansas	6.7500	.....	.....	.....	S. O. Neb. & Indiana Territory, etc.
Kansas	.....	.....	7.0000	(Wt. Avg.)	Kansas only.
North Texas	6.375–6.625	.....	6.375–6.625	.....	.....
West Texas	6.50–6.75	.....	6.50–6.75	.....	.....
Louisiana-Arkansas	6.25–6.50	.....	.....	.....	Michigan, Ohio and Indiana.
Louisiana-Arkansas	.....	.....	7.00	.....	State or differential haul.
Indiana-Illinois	6.75	.....	.....*	.....	S. O. Indiana territory except Detroit and vicinity. For Ohio on delivered basis only.

*Shipments made from E. Chicago, Ind., and Wood River, Ill., according to conditions and freight rates; no prices F.O.B. point of origin can be given.

Chicago Resale Market

CHICAGO, April 5

SPOT U. S. Motor gasoline prices moved higher this week in the Chicago market and were up 0.25-cent on the low of the price range at the end of the week. The bulk of sales was at 6.25 to 6.50 cents on March 31 and at 6.50 to 6.625 cents on April 5. Practically all sales reported were for prompt shipment, as most sellers refused to sell "over a period."

Most Chicago marketers reported their buying prices, for prompt shipment, were 6.50 cents in Oklahoma and 6.375 to 6.50 cents f.o.b. Group 3 in Louisiana and North Texas. They reported that little U. S. Motor was being offered from other districts.

Following prices represent majority of sales made on Group 3 freight basis although shipments may originate in other refining districts such as north and west Texas, Arkansas, Louisiana, Indiana, Illinois, Kentucky, etc.

	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
58-60 U. S. Motor, 437 e.p.	6.50 – 6.75	6.25 – 6.50	6.125– 6.50
60-62 437 e.p. gasoline	6.625– 6.75	6.375– 6.50	6.25 – 6.50
60-62 400 e.p. gasoline	6.75 – 6.875	6.625– 6.75	6.50 – 6.625
64-66 375 e.p. gasoline	7.25 – 7.50	7.125– 7.375	7.00 – 7.25
68-70 350-360 e.p. gasoline	7.50 – 7.75	7.50 – 7.75	7.50 – 7.75
*Domestic Aviation Gasoline	8.75 – 9.50	.....	.....
41-43 w.w. kerosene	4.25 – 4.50	4.25 – 4.50	4.25 – 4.375
42-44 w.w. kerosene	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
38-40 straw distillate	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
32-36 ordinary dark gas oil	2.50 – 2.625	2.50 – 2.625	2.375– 2.625
32-36 dark zero gas oil	2.625– 2.75	2.625– 2.75	2.625– 2.75
32-36 straw zero gas oil	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
28-30 zero fuel oil (per bbl.)	$0.95 –$1.00	$0.975–$1.00	$0.975–$1.025
28-30 fuel oil (per bbl.)	$0.95 –$1.00	$0.95 –$1.00	$0.95 –$1.00
24-26 fuel oil (per bbl.)	$0.775–$0.825	$0.80 –$0.85	$0.80 –$0.875
18-22 fuel oil, low sulfur (per bbl.)	$0.675–$0.725	$0.675–$0.725	$0.70 –$0.75
18-22 fuel oil, high sulfur zero (per bbl.)	$0.65 –$0.70	$0.65 –$0.70	$0.675–$0.725

*U. S. Govt. specifications or better; fighting grade in some instances sells at a premium over domestic aviation grade.

Weighted Average Prices

OKLAHOMA

	Apr. 7		Mar. 31		Mar. 24	
	No. of cars	Price	No. of cars	Price	No. of cars	Price
58-60 U. S. Motor, 437 e.p.	9	6.7361	4	6.5312	18	6.4166
60-62 437 e.p. gasoline	5	6.7500	5	6.5000	No sales reported	
60-62 400 e.p. gasoline	1	7.5000	1	6.8750	4	6.7500
64-66 375 e.p. gasoline	2	7.3750	1	7.1250	No sales reported	
*58-60 437 e.p. gasoline	..	6.50–6.75	..	6.375–6.75	..	6.125–6.50

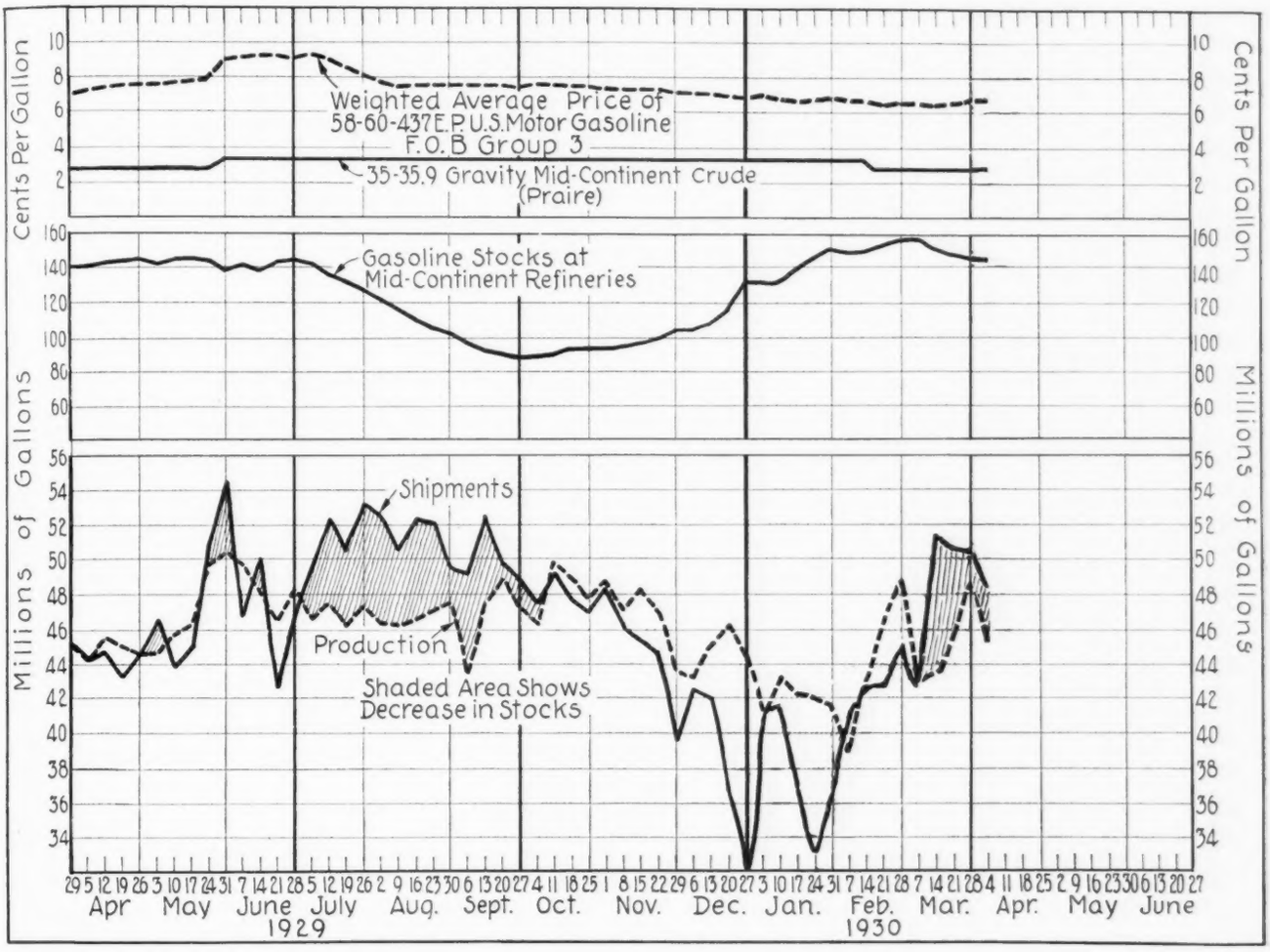
KANSAS

	Apr. 7		Mar. 31		Mar. 24	
	No. of cars	Price	No. of cars	Price	No. of Cars	Price
58-60 U. S. Motor, 437 e.p.	1	7.0000	1	6.8750	No sales reported	

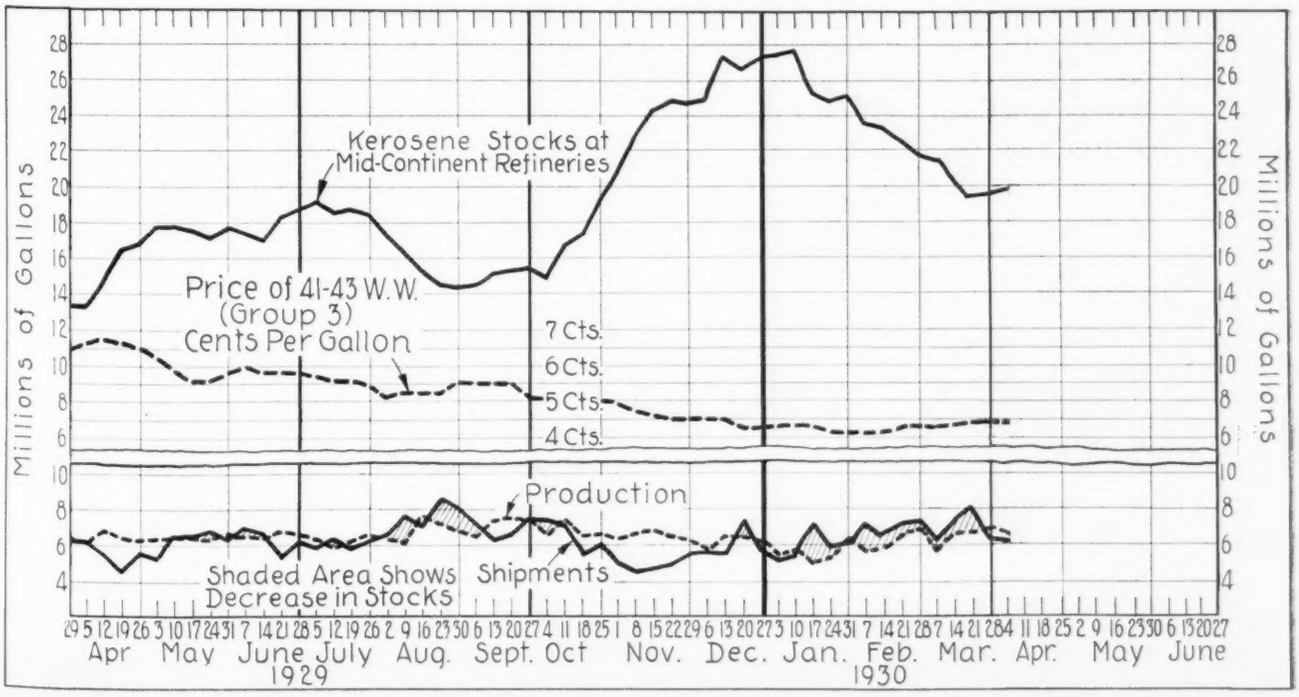
*Full U. S. Motor specifications not guaranteed. Prices represent both quotations and sales.

Barometer of Mid-Continent Refinery Market—Week Ending April 4

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News



Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date as shown in the table on page 114



Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, except where $ is shown

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
48-50 450 e.p. naphtha	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
50-52 450 e.p. naphtha	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
56-58 450 e.p. gasoline	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25
58-60 450 e.p. gasoline	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25
64-66 390 e.p. gasoline	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25
68-70 350-360 e.p. gasoline	7.75	7.50	7.375– 7.50
‡Domestic Aviation Gasoline	8.50 – 9.50	.....	.....

‡U. S. Govt. specifications or better; fighting grade in some instances sells at a premium over domestic aviation grade.

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

52-54 Naphtha	7.25 – 7.375	7.25 – 7.50	7.25 – 7.50
54-56 Naphtha	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50
58-60 U.S. Motor 437 e.p.	7.50 – 7.75	7.375– 7.75	7.25 – 7.75
60-62 400-410 e.p. gasoline	7.75 – 8.25	7.625– 8.125	7.625– 8.125
64-66 390 e.p. gasoline	8.00 – 8.50	7.75 – 8.50	7.875– 8.50
68-70 350-360 e.p.	8.50 – 9.00	8.50 – 9.00	8.50 – 9.00

OHIO (Quotations of S. O. Ohio. 4c state tax to be added.)

U. S. Motor Gasoline

Ohio, delivery at any point	10.00	9.50	9.50

KANSAS (F. o. b. refinery Kansas destination)

60-62 437 e.p. gasoline	7.25	7.00 – 7.25	6.75 – 7.25
60-62 400 e.p. gasoline	7.25 – 7.50	7.25	6.875– 7.25
64-66 375 e.p. gasoline	7.50	7.25 – 7.50	7.25 – 7.50

NORTH TEXAS (F. o. b. North Texas refineries)

56-58 450 e.p. gasoline	6.00	5.75 – 6.00	5.75 – 6.00
58-60 450 e.p. gasoline	6.00	5.75 – 6.00	5.75 – 6.00
58-60 U.S. Motor 437 e.p.	6.375– 6.625	6.125– 6.375	6.125– 6.375
60-62 400 e.p. gasoline	6.75	6.375– 6.50	6.375– 6.50
64-66 390 e.p. gasoline	6.75 – 7.00	6.75 – 7.00	6.75 – 7.00
64-66 375 e.p. gasoline	7.50	7.50	7.50
68-70 350-360 e.p. gasoline	7.75	7.75	7.75

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

50-52 naphtha	5.75	5.50	5.50
58-60 437 e.p. gasoline	6.00 – 6.25	5.75	5.75
58-60 U.S. Motor 437 e.p. gasoline	6.50 – 6.75	6.25	6.25

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

58-60 U.S. Motor gasoline	7.00	7.00	6.75

ARKANSAS (Ark., N. La. and Miss. destination)

58-60 U.S. Motor 437 e.p.	7.00	7.00	6.75

CALIFORNIA (3c tax to be added to California gasoline prices if used in state.)

54-58 U.S. Motor 437 e.p.	7.50 – 8.25	8.50 – 9.50	8.50 – 9.50
54-58 U.S. Motor, for outside state shipment	6.50 – 7.00	7.50 – 8.50	6.50 – 7.25
58-61 375-400 e.p. gasoline	8.50 – 9.50	9.50 –11.00	9.50 –11.00
42-45 Engine Distillate 445-480 e.p.	7.00 – 8.50	7.00 – 8.50	7.00 – 8.00

NATURAL GASOLINE

(Note: End point of all grades, not over 375 F. Corrosion test adopted Oct. 1, 1927; A.S.T.M. Method D130-27T; doctor test, July 2, 1928.)

OKLAHOMA (F. o. b. Oklahoma refineries)

Grade AA, 80-87.9, 90% Recovery	5.75	5.625– 5.75	5.625
Grade A, 72-79.9, 90% Recovery	5.75	5.75	5.75
Grade BB, 84-92, 85% Recovery	5.00	4.875– 5.00	4.75
Grade B, 76-83.9, 85% Recovery	5.00	5.00	5.00
Grade C, 80-92, 78% Recovery	5.00	4.75	4.75

NORTH TEXAS (F. o. b. Breckenridge)

Grade AA, 80-87.9, 90% Recovery	5.75	5.625– 5.75	5.625
Grade A, 72-79.9, 90% Recovery	5.75	5.75	5.75
Grade BB, 84-92, 85% Recovery	5.00	4.875– 5.00	4.75
Grade B, 76-83.9, 85% Recovery	5.00	5.00	5.00
Grade C, 80-92, 78% Recovery	5.00	4.75	4.75

NORTH LOUISIANA (F. o. b. Monroe District)

	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
Grade AA	†6.25	†6.00	†6.00
Grade BB	†5.25	†5.25	†5.25
Grade C	†5.25	†5.00	†5.00

CALIFORNIA (F. o. b. California refineries)

75-85, 375-390 e.p. blend	7.00 – 8.00	7.00 – 7.50	7.50 – 8.25

BURNING OILS

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

45 w.w. kerosene	5.75 – 6.125	5.75 – 6.125	5.75 – 6.125
46 w.w. kerosene	6.125– 6.50	6.00 – 6.50	6.00 – 6.50
47 w.w. kerosene	6.375– 6.75	6.375– 6.75	6.25 – 6.75
300 mineral seal	6.75 – 7.00	6.75 – 7.00	6.75 – 7.00

OKLAHOMA (F. o. b. Oklahoma refineries)

41-43 w.w. kerosene	4.375– 4.50	4.25 – 4.50	4.25 – 4.50
42-44 w.w. kerosene	4.75 – 5.00	4.75	4.75

KANSAS (F. o. b. refinery Kansas destination)

41-43 w.w. kerosene	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
42-44 w.w. kerosene	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25

NORTH TEXAS (F. o. b. North Texas refineries)

40-42 w.w. kerosene	4.125	4.125	4.00 – 4.125
41-43 w.w. kerosene	4.25 – 4.375	4.25 – 4.375	4.25

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

41-43 w.w. kerosene	4.75	4.75	4.50 – 4.75
42-44 w.w. kerosene	5.00	5.00	4.75 – 5.00

ARKANSAS (Ark., N. La. and Miss. destination)

42-44 w.w. kerosene	5.00	5.00	5.00

CALIFORNIA (F. o. b. California refineries)

38-40 w.w. kerosene	4.25 – 5.00	4.50 – 5.50	4.25 – 5.50

NEUTRAL OIL

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

Vis.		(Viscosity at 70° F.)	
200 No. 3 Assoc. Filt.	25.00 –26.00	25.00 –26.00	25.00 –26.00
180 No. 3 Assoc. Filt.	21.00 –22.00	21.00 –22.00	21.00 –22.00
150 No. 3 Assoc. Filt.	15.00 –16.50	15.50 –17.00	15.50 –17.00
		(Non Viscous)	
34 Grav. 330-340 Flash	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50

****OKLAHOMA** (F. o. b. Oklahoma refineries)

Vis.	Color	(Viscosity at 100° F.)		
100	No. 2	6.00 – 7.50	6.00 – 7.50	6.00 – 7.50
150	No. 3	8.00 – 9.00	8.00 – 9.00	7.75 – 8.50
150	No. 4	7.00 – 8.50	7.00 – 8.50	6.75 – 8.00
180	No. 3	9.00 –10.50	9.00 –10.50	9.00 –10.00
180	No. 4	9.00 –10.00	9.00 –10.00	8.75 – 9.50
180	No. 5	8.50 – 9.50	8.50 – 9.50	8.50 – 9.00
200	No. 3	12.00	11.00 –12.00	11.00 –12.50
200	No. 4	10.00 –11.50	10.00 –11.50	10.00 –11.00
200	No. 5	9.50 –11.00	9.50 –11.00	9.50 –11.00
220	No. 3	12.50 –13.50	12.50 –13.50	12.50 –13.50
220	No. 4	12.00 –12.50	12.00 –12.50	12.00 –12.50
220	No. 5	11.00 –12.00	11.00 –12.00	11.00 –12.00
240	No. 3	13.50 –15.50	13.50 –15.50	13.00 –15.00
240	No. 4	12.50 –14.50	12.50 –14.50	12.00 –13.50
240	No. 5	12.00 –14.00	12.00 –14.00	11.00 –13.00
280	No. 3	17.00 –18.00	17.00 –18.00	16.00 –17.00
280	No. 4	15.00 –17.00	15.00 –17.00	14.00 –16.00
280	No. 5	14.00 –15.50	14.00 –15.50	13.00 –15.00

†Prices nominal ††Only one refiner quoting *Quotations only **Represents Both Sales and Quotations.

Refinery Markets Wax, Lubricants, Heavy Oil

Prices given below are in cents per gallon, except where $ is shown

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

GULF COASTAL (F. o. b. Gulf Coastal refineries)

Vis.	Color	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
		(Viscosity at 100° F., pour test 0)		
100	No. 2 Pale	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
200	No. 3 Pale	9.50 – 9.75	9.50 – 9.75	9.50 – 9.75
300	No. 3 Pale	10.75 –11.00	10.75 –11.00	10.75 –11.00
500	No. 3½ Pale	12.00 –12.25	12.00 –12.25	12.00 –12.25
750	No. 4 Pale	13.50 –13.75	13.50 –13.75	13.50 –13.75
1200	No. 5 Pale	16.00 –16.50	16.00 –16.50	16.00 –16.50
200	No. 5½ Red Oil	8.75 – 9.00	8.75 – 9.00	8.75 – 9.00
300	No. 5½ Red Oil	10.00 –10.25	10.00 –10.25	10.00 –10.25
500	No. 6 Red Oil	11.25 –11.50	11.25 –11.50	11.25 –11.50
750	No. 6 Red Oil	12.75 –13.00	12.75 –13.00	12.75 –13.00
1200	No. 5-6 Red Oil	15.00 –15.25	15.00 –15.25	15.00 –15.25

‡CALIFORNIA (F. o. b. California refineries)

Vis.	Color	(Viscosity at 100° F.)		
100	No. 3	9.50 –10.00	9.50 –10.00	9.50 –10.00
200	No. 3	11.50	11.50	11.50
300	No. 3	13.00	13.00	13.00
450	No. 3	15.50	15.50	15.50
550	No. 3	16.50	16.50	16.50
600	No. 3	17.00	17.00	17.00
200	No. 5	11.00	11.00	11.00
300	No. 5	12.00	12.00	12.00
400	No. 5	14.00	14.00	14.00
500	No. 5	15.00	15.00	15.00
600	No. 5	16.00	16.00	16.00
700	No. 7	18.00	18.00	18.00

‡Neutral oils not manufactured commercially in California.

CYLINDER STOCKS

****OKLAHOMA** (F. o. b. Oklahoma refineries)

190-200 Vis. D at 210° Brt. St	41.00 –42.00	41.00 –42.00	41.00 –42.00
150-160 Vis. D at 210° Brt. St., ‡15-20 cold test	37.00	37.00	37.00
150-160 Vis. D Brt. Stock, ‡25-45 cold test	36.00 –36.50	36.00 –36.50	36.00 –36.50
150-160 Vis. E 210° Brt. St	35.00 –36.00	35.00 –36.00	35.00 –36.00
600 St. Ref. Olive Green	9.00 –10.00	9.00 –10.00	9.00 –10.00
600 St. Ref. Dark Green	9.00	9.00	9.00
Black Oil	5.00	5.00	5.00

‡Cold test specifications added Apr. 7 and pour tests eliminated.

PENNSYLVANIA (F. o. b. Western Penna. refineries) (A.S.T.M. Tests)

600 Steam Refined, filterable	23.50 –24.50	23.50 –24.50	24.00 –25.00
650 Steam Refined	29.50 –31.00	29.00 –31.00	29.50 –31.00
600 Flash	31.00 –33.00	32.00 –33.00	32.00 –33.00
630 Flash	35.00 –36.50	35.00 –36.50	35.00 –36.50
600 Warren E	29.50 –30.00	29.00 –30.00	29.00 –30.00
600 Oil City E	28.50 –29.50	28.00 –30.00	28.00 –29.00
600 D Filtered	34.50 –35.00	34.00 –35.00	34.50 –35.00
Cold Test Stock, 40-50 p. p., 140-150 vis. at 210° 540-550 flash, No. 8 color	39.50 –41.00	39.50 –41.00	39.50 –41.00
40-50 p.p., 140-150 vis. at 210°, 540-550 flash, No. 6-6½ color diluted	38.50 –40.00	38.00 –40.00	38.00 –40.00

WAX

PENNSYLVANIA (Per pound, F. o. b. New York)

122-124 white crude scale, a.m.p.	2.625– 2.75	2.625– 2.75	2.625– 2.875
124-126 white crude scale, a.m.p.	2.625– 2.75	2.625– 2.75	2.625– 2.875

****OKLAHOMA** (Per pound in barrels; in a ew instances, per pound in burlap bags; F. o. b. Oklahoma refineries)

124-126 White Crude Scale, a.m.p.	2.375– 2.50	2.50	2.50 – 2.625

CALIFORNIA

Prices on California wax discontinued, as very little is made in California.

DISTILLATE, GAS AND FUEL OIL

PENNSYLVANIA (For outside Pittsburgh district)

36-40 fuel oil	4.125– 4.50	4.25 – 4.50	4.375– 4.625
30-34 fuel oil	4.125– 4.375	4.25 – 4.50	4.375– 4.50
28-32 fuel oil	4.125– 4.375	4.25 – 4.50	4.375– 4.50

†Prices nominal **††Only one refiner quoting** ***Quotations only**

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
38-40 straw distillate	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25
36-38 straw distillate	2.875	2.875	2.875
32-36 straw gas oil	2.50 – 2.75	2.625– 2.875	2.625– 2.875
32-36 straw gas oil zero	3.00	3.00	3.00
32-36 dark gas oil	2.375– 2.50	2.375– 2.50	2.375– 2.50
32-36 dark gas oil zero	2.50 – 2.75	2.50 – 2.75	2.50 – 2.75
28-30 zero fuel oil (per bbl.)	$1.05 – 1.10	$1.05 – 1.10	$1.05 – 1.10
28-30 fuel oil (per bbl.)	$0.95 – 1.00	$0.95 –$1.00	$0.95 –$1.00
26-28 fuel oil (per bbl.)	$0.85 – 0.95	$0.85 – 0.95	$0.85 – 0.95
24-26 fuel oil (per bbl.)	$0.80 – 0.85	$0.80 – 0.85	$0.80 – 0.85
22-26 fuel oil (per bbl.)	$0.725– 0.775	$0.75 – 0.80	$0.775– 0.80
18-22 fuel oil (per bbl.)	$0.625– 0.675	$0.625– 0.70	$0.65 – 0.75
16-20 fuel oil (per bbl.)	$0.55 – 0.60	$0.60 – 0.70	$0.625– 0.70
14-16 fuel oil (per bbl.)	$0.50 – 0.60	$0.60 –$0.65	$0.625– 0.70

KANSAS (F. o. b. refinery Kansas destination)

38-40 straw distillate	3.50 – 3.75	3.50 – 3.75	3.50 – 3.75
36-38 straw distillate	3.25	3.25	3.25
32-36 straw gas oil	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
18-22 fuel oil (per bbl.)	$0.80 – 0.85	$0.80 – 0.85	$0.80 – 0.85
10-14 fuel oil (per bbl.)	$0.725– 0.775	$0.725– 0.775	$0.725– 0.775

NORTH TEXAS (F. o. b. North Texas refineries)

38-40 straw distillate	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25
38-40 p.w. treated distillate	3.25	3.25	3.25
32-36 gas oil, cracked	2.50	2.50	2.50
32-36 St. reduced gas oil	2.25 – 2.50	2.25 – 2.50	2.375– 2.50
24-26 fuel oil (per bbl.)	$0.60 – 0.65	$0.60 – 0.65	$0.60 – 0.65
20-24 fuel oil (per bbl.)	$0.55	$0.55	$0.575
18-22 fuel oil (per bbl.)	$0.50	$0.50	$0.55

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

34-38 gas oil	2.50 – 2.75	2.50 – 2.75	2.50 – 2.75
30-32 gas oil	2.25 – 2.50	2.25 – 2.50	2.25 – 2.50
28-30 zero gas oil	2.50 – 2.875	2.50 – 2.875	2.50 – 2.875
18-22 fuel oil (per bbl.)	$0.60 – 0.80	$0.60 – 0.80	$0.60 – 0.80

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

32-36 gas oil, dark	3.00	3.00	3.00
30-32 gas oil, straw	3.00	3.00	3.00
14-16 fuel oil (per bbl.)	$0.75 – 0.85	$0.75 – 0.85	$0.75 – 0.85

ARKANSAS (Ark., N. La. and Miss. destination)

30-32 gas oil, straw	3.00	3.00	3.00
32-36 dark gas oil	3.00	3.00	3.00
28-30 gas oil	2.75	2.75	2.75
20-24 fuel oil (per bbl.)	$0.95	$0.95	$0.95
9-12 fuel oil (per bbl.)	$0.75	$0.75	$0.75
Black oil	3.25	3.25	3.25

CALIFORNIA (F. o. b. San Joaquin Valley. Pipe line charge to San Francisco 24c per bbl. more and to San Pedro 20c per bbl. more.)

14-18 fuel oil (per bbl.)	$0.50 –$0.65	$0.50 –$0.65	$0.45 –$0.55
14-18 Bunker oil (per bbl.)	$0.70 –$0.75	$0.70 –$0.75	$0.70 –$0.75
30-34 gas oil (per bbl.)	$0.70 –$0.90	$0.70 –$0.90	$0.70 –$0.90
27 Plus Diesel oil (per bbl.)	$0.70 –$0.90	$0.70 –$0.90	$0.70 –$0.90

PETROLATUMS

PENNSYLVANIA (Per pound, in barrels, carload lots, f. o. b. refinery. In tank cars ⅝c to ¾c per pound less.) Two refiners quoting.

Snow White	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
Lily White	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50
Cream White	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
Light Amber	3.50 – 3.625	3.50 – 3.625	3.50 – 3.625
Amber	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375
Red	3.00	3.00	3.00

PETROLEUM COKE

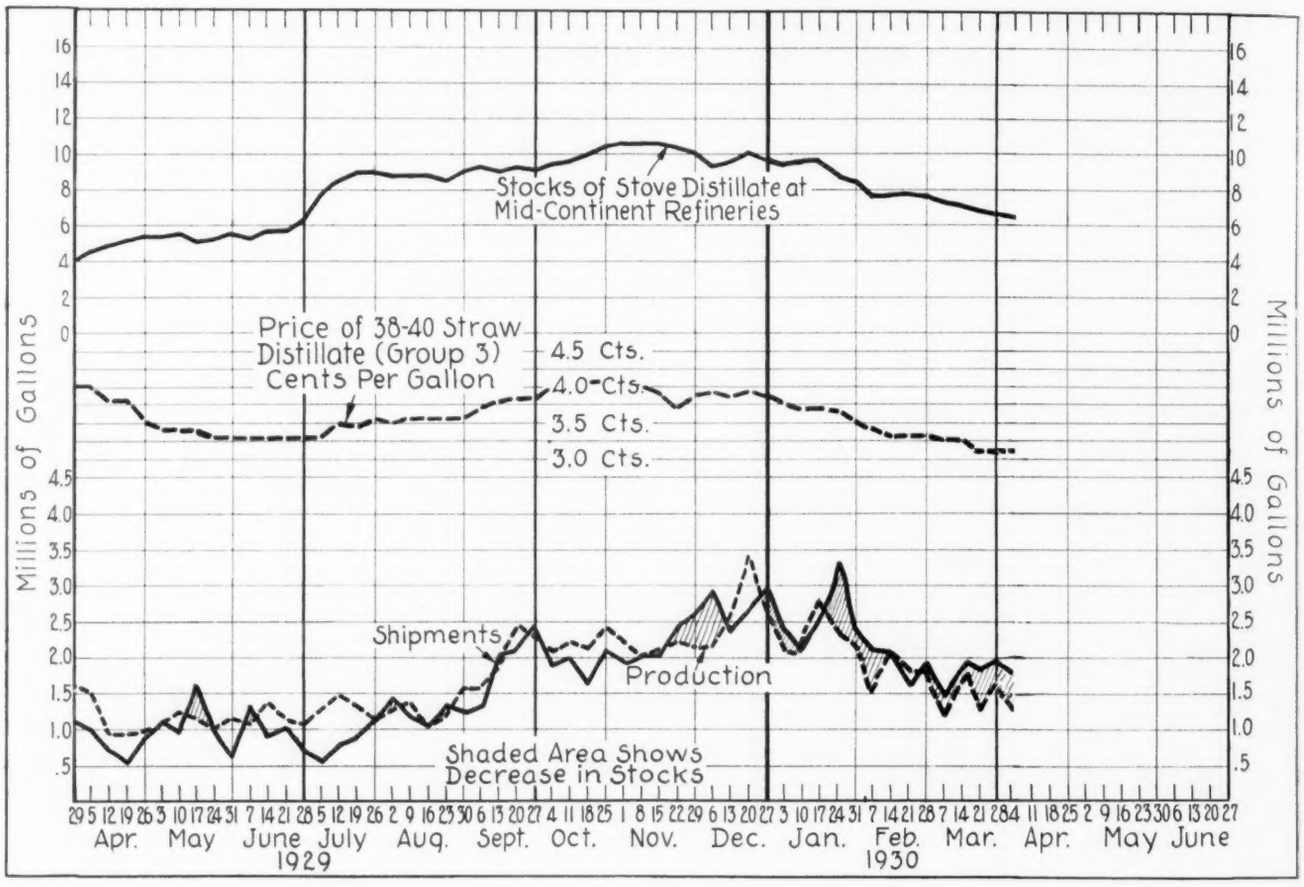
****OKLAHOMA** (F. o. b. Oklahoma refineries)

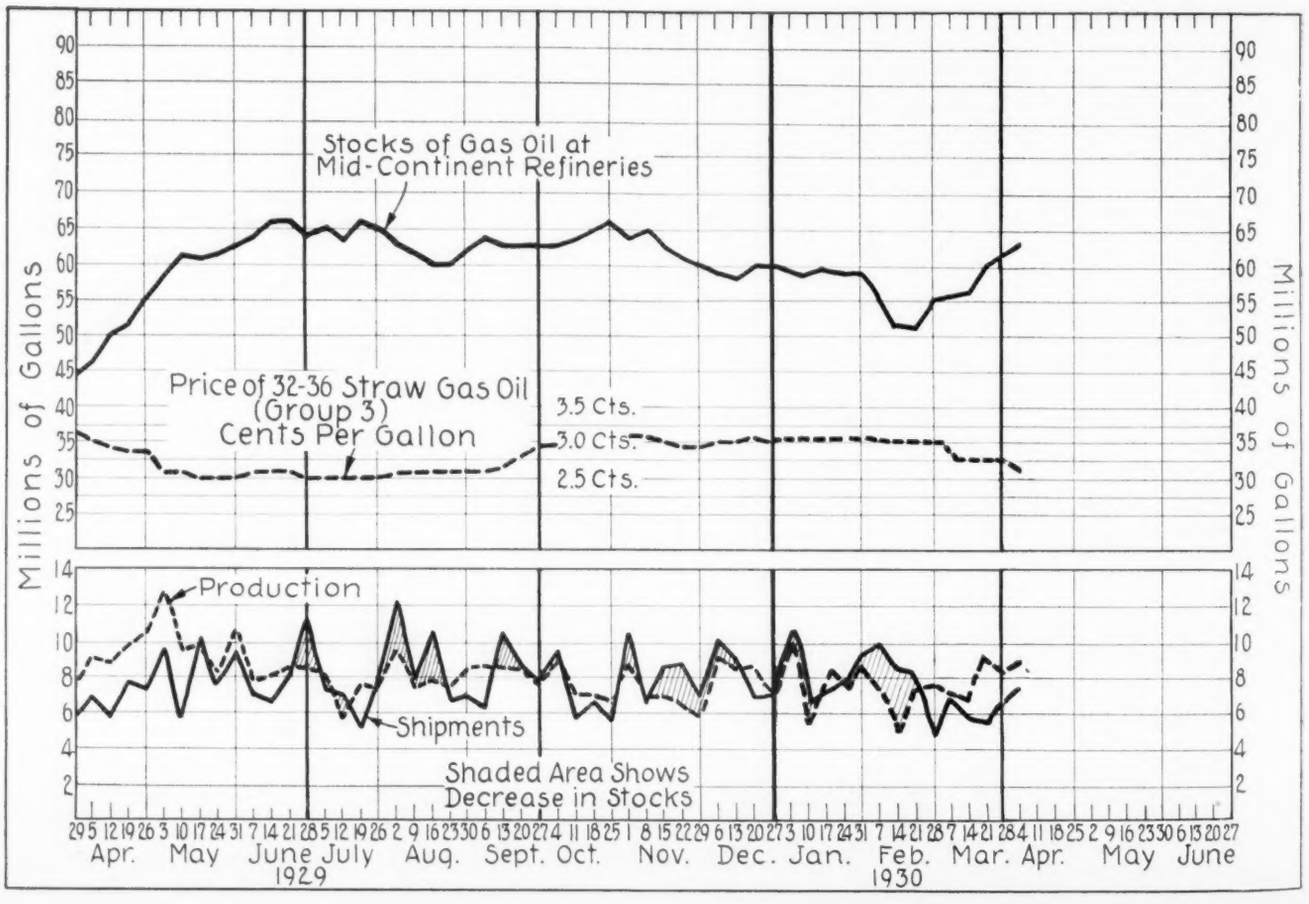
	(Per ton in car lots)		
Lump	$4.50 – 5.00	$4.50 – 5.00	$4.50 – 5.00
Still run	$3.00	$3.00	$3.00
Breeze	$2.00	$2.00	$2.00

****Represents Both Sales and Quotations**

Barometer of Mid-Continent Refinery Market—Week Ending April 4

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News


Stocks of Stove Distillate at Mid-Continent Refineries
Price of 38-40 Straw Distillate (Group 3) Cents Per Gallon
4.5 Cts.
4.0 Cts.
3.5 Cts.
3.0 Cts.
Shipments
Production
Shaded Area Shows Decrease in Stocks
Millions of Gallons
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1929
1930


Stocks of Gas Oil at Mid-Continent Refineries
Price of 32-36 Straw Gas Oil (Group 3) Cents Per Gallon
3.5 Cts.
3.0 Cts.
2.5 Cts.
Production
Shipments
Shaded Area Shows Decrease in Stocks
Millions of Gallons
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1929
1930

APCO

"More POWER to you". . . . .

APCO HI-COMPRESSION GASOLINE combines high test and "anti-knock" virtues with reasonable premium cost. After exhaustive tests, we now offer the new APCO—made at Cyril, Oklahoma—with high gravity, low endpoint, and extra high benzol equivalent. APCO is a high test, "anti-knock" motor fuel, available in either red or water-white. APCO means "more power to you."

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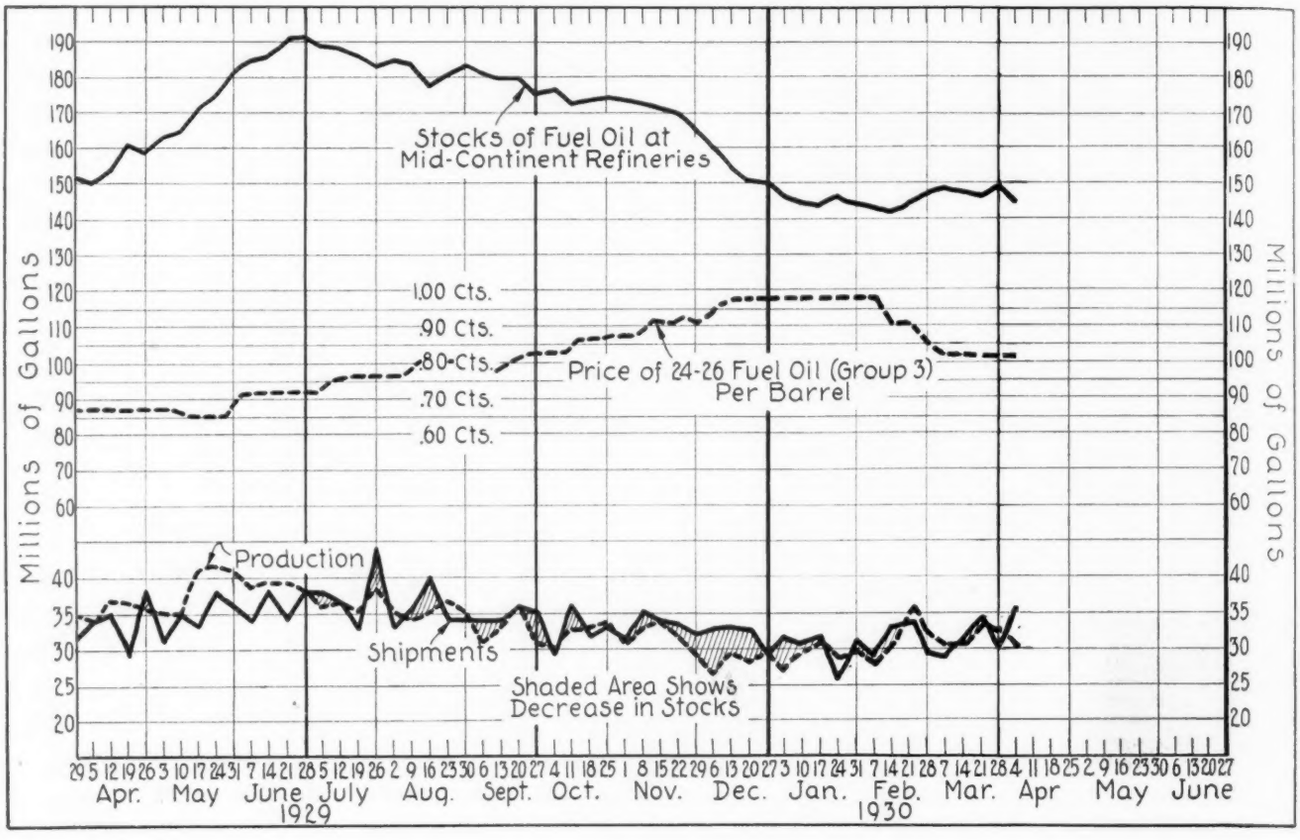
Barometer of Mid-Continent Refinery Market—Week Ending April 4

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News



California Refinery Market

Cargo Trading Dull; Local Markets Down

LOS ANGELES, April 5

LOCAL marketing conditions continued far from satisfactory on the Pacific Coast in the week ended April 5 and little, if any, improvement was noted in bulk markets, either export or intercoastal.

With charter rates on clean boats slightly lower at $0.85 per barrel, California exporters were slightly more optimistic over the outlook although the majority of traders do not expect any increase in business with either Atlantic domestic or Atlantic foreign accounts until seasonal demand is felt in these areas.

An independent refiner reported receiving a firm offer of 6 cents from an eastern seaboard buyer for a cargo of U. S. Motor gasoline to be lifted in June. Generally speaking, sellers were not interested in booking business this far ahead.

Several shipments of fuel oil have been made to Pacific foreign ports during the past ten days.

An independent refiner stated that although the recent increase in crude oil prices justified an increase in fuel oil prices overabundance of stocks have acted as a drug on the market. This refiner recently made several spot sales of fuel oil at $0.60 in cargo lots to Pacific foreign buyers.

Local tank car markets showed several notable revisions during the past week with wide variations in quotations reported.

U. S. Motor gasoline for use at points within the state was available "at your own figure," according to one dealer, who stated he had moved a number of tank cars at 7.50 cents although prevailing prices at the close of the previous week had ranged from 8.50 to 9.25 cents, tax additional.

Another independent refiner reported gasoline could be bought at around 7 cents in large quantities but that he expected conditions to be improved within a short time.

Motor fuel prices for shipment outside the state also were reported shaded in a number of instances with spot sales made at less than 6.50 cents. A majority of the trade stated that they would pass up business rather than sell at these low prices.

Cheap gasoline was thought to be due to crowded storage and to the fact that small refiners with contracts calling for delivery of specific amounts of crude were forced to unload.

Extremely warm weather on the Pacific Coast has caused a noticeable lull in the demand for natural gasoline for blending. Quotations for absorption gasoline ranged from 7 to 8 cents with the few spot sales reported being made at the lower price.

A major company reported to have contracted for a large amount of natural gasoline at 7.50 cents has been forced to unload at 7.25 cents. One refiner said he had closed a deal whereby he was to receive several tank cars of natural gasoline, delivered, at 7.50 cents.

Reports were heard of low priced fuel oil moving to various destinations on the Pacific Coast. One company sold several cars at $0.45; quotations ranged up to as high as $0.65 per barrel.

Retail market conditions continued to concern local refiners. The actual tank wagon delivery price at service stations in the Los Angeles basin was 12.50 cents.

Pennsylvania Market

Prices Unchanged; Demand Good

CLEVELAND, April 5.—Little change was apparent in refined oil prices in the western Pennsylvania market during the week ended April 5. Jobber buying of gasoline for both spot and deferred shipment continued fairly good and activity of other commodities increased slightly.

Occasional cars of 58-60 U. S. Motor gasoline still were available in some districts at as low as 7.25 cents but sales at this figure, according to reports, represented but a small percentage of the total volume sold. The majority of sellers quoted 7.50 to 7.75 cents and reported little difficulty in selling at the former figure for spot shipment and at the latter figure for shipment over the balance of the month. Sales of 58-60 U. S. Motor for shipment the latter part of the month were reported at as high as 8 cents a gallon.

High gravity gasoline prices moved slightly higher in sympathy with U. S. Motor. There was but little improvement in the demand for these grades from domestic jobbers; Canadian buyers, however, purchased fairly large quantities of the 64-66, 390 end point gasoline.

Kerosene buying, especially from southern districts of the consuming territory, was on a larger scale but it was still insufficient to eliminate 5.75-cent 45 w.w. from the market.

Fuel oil continued to be the softest spot in the market. Slack demand caused prices to slip 0.125-cent on the low end of the market. Both the light and heavy grades of fuel oil were rather freely offered at 4.125 cents a gallon; sales, however, were reported at as high as 4.50 cents.

The steam refined market continued tight. Very little material was offered in the open market for prompt shipment and sellers were unwilling to commit themselves on futures at current prices. Buyers reported it difficult to better 23.50 cents on good filterable 600 stock.

Filtered stocks also were offered sparingly and prices held steady. Increased inquiries for bright stock were reported, but actual buying has been slow in getting under way, according to trade reports. Prices were unchanged, however.

Wax was freely offered at 2.625 cents a pound, New York, both for the 122-124 and 124-126 A.m.p. grades. This price was shaded in a few instances, but for the most part buyers' bids were too low to encourage firm offers from sellers.

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BROWN SHEET IRON & STEEL CO.
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Eastern Domestic Markets

Gasoline Prices Generally Unchanged

Staff Special
NEW YORK, April 5

EASTERN markets lacked outstanding features the past week and prices generally were unchanged. Gasoline prices in more southern districts held their own, while at New York harbor and in New England shading of posted quotations was reported. Kerosene demand was light and some shading of posted prices was reported at New York. Other oils were inactive.

The New York market stood apart from the others as far as the gasoline market was concerned, although conditions in this district virtually were unchanged compared with a week ago. At the end of the week two refiners selling U. S. Motor gasoline raised their quotations to 9 cents per gallon, but indicated they were not obtaining any orders. Other companies were quoting from 7.75 to 8.50 cents for regular U. S. Motor and it was within this price range that gasoline actually moved. Some barge business and a small amount of tank car business was reported placed below the low quotation. A barge load of approximately 10,000 barrels was sold at a fraction below 7.50 cents, f.o.b. the harbor. This gasoline moved into upper New York state.

The wide range of prices was due to low tank wagon markets in New York state and New England, which have practically established two markets from New York harbor. The low prices governed shipments into the upper part of the state and more northern districts, while higher prices were obtained on gasoline shipped into eastern Pennsylvania and into northern New Jersey.

Jobbers were buying only limited quantities of gasoline,—enough to take care of their immediate requirements,—and showed but little interest in purchasing for deferred delivery.

Posted quotations for gasoline were being shaded on shipments into western Massachusetts and into Connecticut. Some refiners quoted 9.25 cents delivered, and 9 cents delivered, into these districts over April. Some gasoline moved in barge lots from New Haven at under posted tank car quotations according to reports. One refiner quoted 8.50 cents delivered, for barge business out of Boston and there were unconfirmed reports of that figure being shaded.

California gasoline at New York and Philadelphia was quoted at higher prices at the end of the week. Distributors at New York quoted 8.50 to 9 cents and Philadelphia sellers 8.50 cents flat. A New York distributor reported he had obtained more than 8.50 cents on a few shipments where he was able to obtain a premium for California gasoline. The Baltimore market was unchanged although one seller was considering advancing his price to 8.75 cents. He had sold approximately 2,000,000 gallons over April at 8.50 cents, he said.

Because of low prices prevailing on the east coast there were no cargo sales of California gasoline reported made to Atlantic seaboard buyers. Gasoline in cargo lots was quoted at prices which some of the trade considered high in view of recent distress material that has been eliminated and it was believed lower prices could be done on firm offer. One cargo was reported traded by two eastern companies on the basis of 7 cents delivered. This price has been done on several cargoes in recent weeks and the trade believed it could be done again considering reports of excessive storage on the west coast.

Kerosene prices were unchanged in all districts. While the trade report business slow, none has reduced quotations below 7.25 cents and several were asking up to 7.75 cents.

All markets for other commodities were unchanged although one or two refiners at New York asked higher prices for gas oil.

Gulf Coast Markets

Bunker Oil Advances 5 Cents a Barrel

Staff Special
NEW YORK, April 5

BULK gasoline and kerosene markets were unchanged at the Gulf the past week. Foreign buyers showed but little interest in the market. Prices for Grade C Bunker oil in cargo lots moved upward and Panuco crude oil prices were lower.

Bunker C fuel oil prices rose to higher levels early in the week, moving to a flat price of $0.75 per barrel whereas a week ago refiners were willing to accept business at $0.70 cents per barrel. In addition to two sellers who were reported out of the market a week ago, another company was using practically all of its oil for bunkering its own ships and also was out of the market. Stocks were reported drifting toward favorable levels due to the reduction of refinery operations. One company indicated it was not interested in accepting orders under $0.80 per barrel.

Panuco crude oil prices slipped to $0.70 flat and some traders were of the opinion this price might be shaded with firm offer. One supplier indicated $0.66, f.o.b. Tampico, would be accepted for immediate shipment.

There were unconfirmed reports among the trade that two foreign buyers were interested in purchasing cargoes of gasoline and kerosene. According to one operator, a United Kingdom account was seeking a cargo but was endeavoring to better prices posted by the Export association. Another trader reported a French account was in the market. Nothing definite could be learned about either of the inquiries.

While the amount of gasoline available in the Mid-Continent at prices which would move from the Gulf under association postings was believed to be small, there were some traders who thought possibly a couple of cargoes or more could be obtained at low prices. Some sellers believed this gasoline was available in Oklahoma and Texas, but thought there was nothing now available in Louisiana where surplus was reported a few weeks ago. Some of the trade have estimated there have been as many as 16 cargoes of non-association gasoline moved from the Gulf since the first of the year. Reports of a rift in the ranks of the association have been refuted by its members who claim the organization is functioning more smoothly than ever and with greater results.

Domestic markets at the Gulf were completely in the doldrums and no business was reported placed. The price advance in gasoline which some of the trade expected with warmer weather and higher field prices, failed to materialize.

Gulf Coast Demand Steady

HOUSTON, April 7.—Continued satisfactory demand for Gulf Coastal lubricants is reported by Houston district manufacturers. The heavier viscosities dominate in sales, with prices firm on all grades. Prices are unchanged.

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All grades of lubricating oils and greases.

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No stockholders to receive profits

Wax Markets

Low Prices Stimulate Activity

NEW YORK, April 5.—Wax markets were a trifle more active toward the end of the past week; prices for the majority of grades were unchanged however. Foreign buyers showed more inclination to buy for forward shipment and a few small sales were made for immediate movement. Prices for yellow crude scale and one grade of fully refined wax were lower.

United Kingdom buyers bought small lots of white crude scale the past week at prices ranging from 2.625 cents to 2.65 cents, f.a.s. New York. They were interested also in buying for forward shipment as indicated by an inquiry received from one buyer for 1300 tons for shipment from next May until January. The account bid 2.50 cents f.a.s. New York. This bid apparently was lower than refiners were willing to accept as the business still was open at the end of the week. There also was a report that a foreign account was seeking 1000 tons for forward shipment, but this report could not be confirmed.

Yellow crude scale was quoted at 2.50 to 2.625 cents both at New York and the Gulf. Offerings late in the week were made at the lower figure and some business was transacted on that basis. There still was a comparatively small amount of this wax available, the trade reported, and the offerings were of small lots.

Fully refined waxes were more active. The Spanish Monopoly came into the market late in the week for 1000 tons of 125-127 A.m.p. fully refined, but the business remained untaken at the end of the week. The trade was of the opinion that if this order were placed, it would go at the low quotation of the market, 3.625 cents, or lower. Some traders were inclined to believe that for a quantity as large as 1000 tons, a better price than 3.625 cents might be obtained. The Monopoly specified prompt shipment in its inquiry.

Inquiry for 128-130 A.m.p. has slackened both at New York and the Gulf with the result that quotations for this grade were lower in both markets. The majority of sellers were asking 4 cents for this grade at New York and 3.875 to 4 cents at New Orleans. Most traders did not look upon the increasing number of inquiries this week as an indication of low foreign stocks. They took it that foreign buyers believed the market virtually on bottom and were willing to commit themselves on future business at slightly under the current market.

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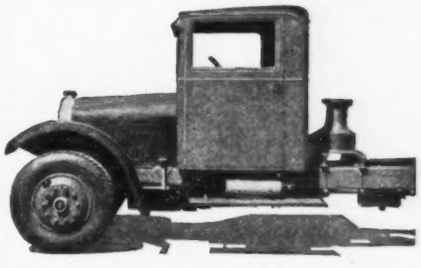
Stack a Highland Cab against any other cab on the market. You'll choose the Highland every time. Inspect these better cabs at your distributor's or write us for more information.



The Highland Body Mfg. Co.
430 Elmwood Place, Cincinnati, Ohio

HIGHLAND
for Cabs

Complete Seaboard Market

(Export Markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets complete for the whole year)

Eastern Domestic Market

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of sales and quotations. Prices shown below do not include inspection tax levied in some states.)

	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
U. S. MOTOR GASOLINE			
New York harbor	†7.75 – 8.50	†7.75 – 8.50	†7.75 – 8.50
Portland district	*9.30	*9.30	*9.30
Boston district	*9.00	*9.00	*9.00
Providence district	*9.00	*9.00	*9.00
Philadelphia district	8.25 – 8.50	8.25 – 8.50	8.25
Baltimore district	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
Norfolk district	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
Charleston district	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
Savannah district	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
Jacksonville district	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
CALIFORNIA, U. S. MOTOR GASOLINE			
New York harbor	†8.50 – 9.00	†8.50 – 8.75	†8.50 – 8.75
Philadelphia district	8.50	8.25 – 8.50	8.25 – 8.50
Baltimore district	8.50	8.50	8.50
DOMESTIC AVIATION GASOLINE ‡(U. S. Gov't. specifications or better. Prices represent majority of quotations).			
New York harbor	11.50 –12.50	.....	.....
Philadelphia	11.50	.....	.....
Baltimore	11.50 –12.50	.....	.....
Boston	11.50 –12.50	.....	.....

‡Gasoline of fighting grade specifications in some instances sells at a premium over domestic aviation grade.

WATER WHITE KEROSENE			
New York harbor	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
Philadelphia district	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
Baltimore district	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
GAS OIL: 28-34 Gravity			
New York harbor	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
Boston district	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
FURNACE OIL: 36-40 Gravity			
New York harbor	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
Boston district	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
GRADE C BUNKER OIL (Lighterage 5c per bbl. additional)			
New York Harbor	$1.05	$1.05	$1.05
Boston district	$1.05	$1.05	$1.05
DIESEL OIL			
New York harbor	$2.00*–$2.10	$2.00 –$2.10	$2.00 –$2.10

*Minimum delivered. †Nominal. **Delivered prices.

New York Export Market

(Lubricating oils are per gal. in bbls. F.a.s. New York)

	Apr. 7	Mar. 31	Mar. 24
CYLINDER OILS (Pennsylvania Products)			
Bright stock, dark	45.00 –47.00	45.50 –47.00	45.50 –47.00
600 D filtered	38.75 –40.00	38.75 –40.00	38.75 –40.00
600 Warren E filtered	35.00 –37.00	35.00 –37.00	35.00 –37.00
600 s.r. unfiltered	28.50 –29.50	29.50 –31.00	29.50 –31.00
650 s.r. unfiltered	35.00 –37.00	36.00 –37.00	36.00 –37.00
600 flash, s.r.	37.50 –40.00	38.00 –40.00	38.00 –40.00
630 flash, s.r.	42.50 –44.00	43.00 –44.00	43.00 –44.00
RED ENGINE OILS (Vis. 100°)			
300 vis. No. 6½ color	20.00 –21.00	20.00 –21.00	20.00 –21.00
250 vis. No. 6 color	17.50 –18.50	17.50 –18.50	17.50 –18.50
200 vis. No. 6 color	16.50 –17.50	16.50 –17.50	16.50 –17.50
PALE ENGINE OILS (Vis. 100°)			
230 vis. No. 3¾ color	23.00 –24.00	23.00 –24.00	23.00 –24.00
180 vis. No. 3¼ color	19.00	19.00	19.00
100 vis. No. 2¼ color	15.50 –16.00	15.50 –16.00	15.50 –16.00
MOTOR OILS (Vis. 100°)			
600 vis. No. 7 color	30.00	30.00	30.00
500 vis. No. 6½ color	26.50 –27.50	26.50 –27.50	26.50 –27.50
400 vis. No. 7¼ color	23.00 –25.00	23.00 –25.00	23.00 –25.00
300 vis. No. 6 color	20.00 –22.00	20.00 –22.00	20.00 –22.00
200 vis. No. 6 color	18.00 –20.00	18.00 –20.00	18.00 –20.00

Wax Markets

(Prices in cents per pound, A.S.T.M. tests; A.M.P.)

	Apr. 7	Mar. 31	Mar. 24
NEW YORK (F.a.s. carload lots)			
124-126 Yellow crude scale	2.50 – 2.625	2.625	2.625
122-124 White crude scale	2.625– 2.75	2.625– 2.75	2.625– 2.75
124-126 White crude scale	2.625– 2.75	2.625– 2.75	2.625– 2.75
123-125 Fully refined	3.50 – 3.625	3.50 – 3.625	3.50 – 3.625
125-127 Fully refined	3.625– 3.875	3.625– 3.875	3.75 – 3.875
128-130 Fully refined	4.00	4.00 – 4.25	4.00 – 4.25
130-132 Fully refined	4.50	4.50	4.50
133-135 Fully refined	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
135-137 Fully refined	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
NEW ORLEANS (F.a.s. carload lots)			
124-126 Yellow crude scale	2.50 – 2.625	2.625	2.625
122-124 White crude scale	2.625– 2.75	2.625– 2.75	2.625– 2.75
124-126 White crude scale	2.625– 2.75	2.625– 2.75	2.625– 2.75
123-125 Fully refined	3.50	3.50	3.50
125-127 Fully refined	3.625– 3.75	3.625– 3.75	3.75
128-130 Fully refined	3.875– 4.00	3.875– 4.125	3.875– 4.125
130-132 Fully refined	4.375	4.375	4.375
133-135 Fully refined	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25

Gulf Export Market

(Prices are f. o. b. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. or more unless otherwise noted.)

GASOLINE	Apr. 7	Mar. 31	Mar. 24
U. S. Motor	†8.00	†8.00	8.00
60-62, 400 e.p.	†9.00	†9.00	9.00
61-63, 390 e.p.	†9.25	†9.25	9.25
64-66, 375 e.p.	†9.50	†9.50	9.50
U. S. Motor, cases (cargoes)	$1.85	$1.85	$1.85
64-66, cases (cargoes)	$2.05	$2.00	$2.05

†These prices are posted quotations of the Export Petroleum Assoc., Inc., governing about 90% of the gasoline and kerosene shipped to foreign ports from the Gulf.

KEROSENE	Prices Apr. 7	Prices Mar. 31	Prices Mar. 24
44 water white	†7.00	†7.00	7.00
41-43 prime white	†6.00	†6.00	6.00
Water white, cases (cargoes)	$1.75	$1.75	$1.85
Prime white, cases (cargoes)	$1.65	$1.65	$1.75

†These prices are posted quotations of the Export Petroleum Assoc., Inc., governing about 90% of the gasoline and kerosene shipped to foreign ports from the Gulf.

DOMESTIC GAS & BUNKER OILS			
*26-30 translucent gas oil	3.50 – 3.75	3.50 – 3.75	3.625– 3.875
*30 plus translucent gas oil	3.875– 4.00	3.875– 4.00	3.875– 4.125
Grade C bunker oil	$0.95	$0.95	$0.95
Grade C bunker oil, cargoes	$0.75	$0.70 –$0.75	$0.70

*Less than ½ of 1% sulphur.

MEXICAN CRUDE AND BUNKER OILS (f. o. b. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid	$0.70	$0.70 –$0.75	$0.70 –$0.75
Grade C bunker oil for bunkering purposes, taxes paid	$1.00	$1.00	$1.00

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F. cold test 0. Tanker, f. o. b. Houston)			
100 vis. No. 2 unfiltered pale	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
200 vis. No. 3 unfiltered pale	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
300 vis. No. 3 unfiltered pale	8.875– 9.50	8.875– 9.50	8.875– 9.50
500 vis. No. 3½ unfiltered pale	10.25 –11.25	10.25 –11.25	10.25 –11.25
750 vis. No. 4 unfiltered pale	12.50 –12.75	12.50 –12.75	12.50 –12.75
1200 vis. No. 5 unfiltered pale	16.00 –18.00	16.00 –18.00	16.00 –18.00
200 vis. No. 5-6 red oil	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25
300 vis. No. 5-6 red oil	8.375– 8.50	8.375– 8.50	8.375– 8.50
500 vis. No. 5-6 red oil	9.25 – 9.50	9.25 – 9.50	9.25 – 9.50
750 vis. No. 5-6 red oil	11.50	11.50	11.50
1200 vis. No. 5-6 red oil	15.00 –15.25	15.00 –15.25	15.00 –15.25

Gulf Domestic Market

(Prices are f.o.b. Gulf oil terminals in Texas and Louisiana in shipments of 20,000 bbls. or more, representing sellers' opinions, for domestic shipment only.)

	Apr. 7	Mar. 31	Mar. 24
U. S. Motor gasoline	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125
41-43 w.w. kerosene	5.875– 6.25	5.875– 6.25	5.875– 6.25
*26-32 translucent gas oil	3.75 – 4.00	3.75 – 4.00	3.875– 4.125

*Less than ½ of 1% sulphur.

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Apr. 7	Mar. 31	Mar. 24
Gasoline, U. S. Motor, 53-55 Gravity	6.00 – 7.00	6.00 – 7.00	6.00 – 7.00
Gasoline, U. S. Motor-blends and special cuts	7.25 –10.00	7.25 –10.00	7.25 –10.00
Gas Oil, 30-34, per barrel	$0.80 –$1.05	$0.80 –$1.05	$0.80 –$1.05
Diesel Oil, 27 plus, per barrel	$0.75 –$1.00	$0.75 –$1.00	$0.75 –$1.00
Bunker oil, 14-18, per barrel	$0.65 –$0.85	$0.65 –$0.85	$0.65 –$0.85
Fuel oil, 14-18 per barrel	$0.60 –$0.85	$0.60 –$0.85	$0.60 –$0.85
Kerosene, 38-40 w.w., 125-150 flash, per gal.	5.00 – 6.00	5.00 – 6.00	5.00 – 6.00
Cased Goods			
Gasoline, U. S. Motor	$1.75 –$1.85	$1.75 –$1.85	$1.75 –$1.85
Kerosene, 38-40 w.w., 125-150 flash	$1.45 –$1.50	$1.45 –$1.50	$1.45 –$1.50

†**Note:** Above Pacific Export market prices for gasoline and kerosene in cargo lots apply only on goods for coastwise shipment. Gasoline and kerosene prices for shipment to foreign ports are determined as follows: Difference in freight between U. S. Gulf to European Continent and California to European Continent —this difference plus 0.125c for handling, deducted from prices posted at U. S. Gulf by the Export Petroleum Assoc., Inc., which are above prices.

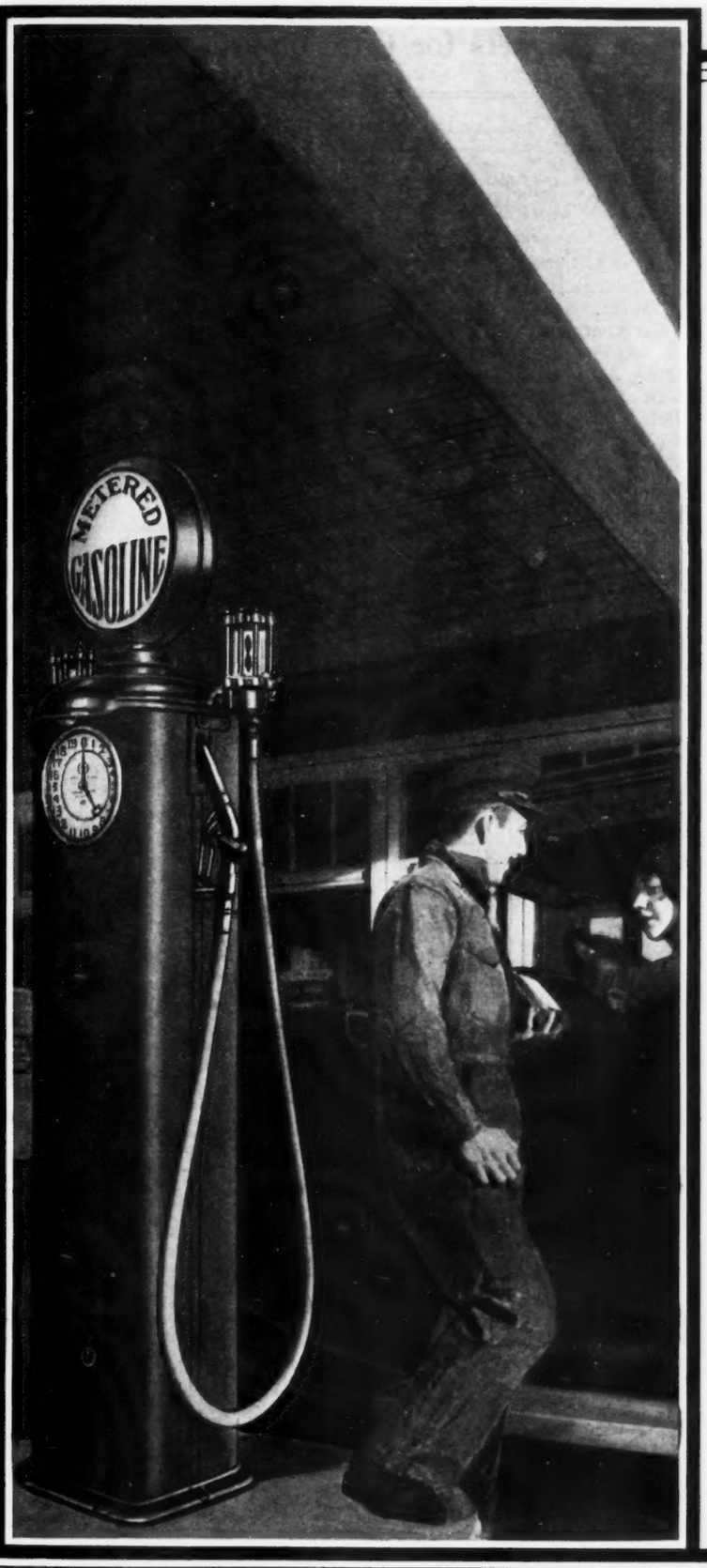
Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to American ports, cents per barrel.)

	Apr. 7 Crude &/or Fuel	Refined Oil &/or Spirits
Calif. to U. K. or Continental ports*	35-40	42/6
Gulf to U. K. or Continental ports*	26-28	32/6
North Atlantic to U. K. or Continental ports*	23/6-25	29-30
Calif. to North Atlantic ports (not E. of N. Y.)	$0.90-$1.00	$0.90-$1.00
Gulf to North Atlantic ports (not E. of N. Y.)**	40-42	36-38

*Continental ports in the range between Bordeaux and Hamburg, both inclusive.

**Venezuela loading same rate. For Tampico 3c to 4c per bbl. additional.



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..THE OPERATOR OF THIS G & B METER PUMP CAN SELL MORE SPECIALTIES

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THE proof of pump value is its selling ability. One large oil company which installed G & B Nozzle Control Meter Pumps found its sales mounting on an average of two more gallons per customer. Nothing mysterious or magical about that.

A fast pumping unit, plus nozzle control, is the answer. The operator fills the tank with a single operation. The customer sees the gas flow through the visible discharge indicator, watches the meter go round, hears the bell, checks the gallons by his own dash gauge and is satisfied.

Plenty of time saved to sell more specialties, auto polish, grease jobs, oil, tires. Sales and more sales. No one minds when they get such quick service. And as the "pump man" doesn't have to "pump" this G & B, he has more energy to put into his selling talk.

For specifications of this well-built G & B, write for Bulletin T-105—now while you remember it.

THE STAR SALESMAN

GILBERT AND BARKER MANUFACTURING COMPANY

PUMPS AND TANKS FOR THE OIL TRADE

SPRINGFIELD, MASS.

"DEPENDABLE PUMPS—FOR EVERY SERVICE STATION NEED"

Tank Wagon, Service Station Markets for Gasoline and Kerosene

(OIL PRICE HANDBOOK has t.w. and s.s. markets for a whole year, arranged for quick reference)

These Prices in Effect Apr. 7, 1930, as Posted by Principal Marketing Companies

S.O. NEW JERSEY TERRITORY

	Gasoline		Total		Oil
	T.W.	Tax	T.W.	S.S.	T.W.
Atlantic City, N. J.	14.5	2	16.5	18.5	13.5
Newark, N. J.	13.5	2	15.5	17.5	12.5
Annapolis	14	4	18	20	13
Baltimore, Md.	13.2	4	17.2	19.2	10.5
Cumberland, Md.	15	4	19	21	14
Washington, D. C.	13.7	2	15.7	17.7	12.7
Danville, Va.	14.8	5	19.8	21.8	13.8
Norfolk, Va.	13.3	5	18.3	20.3	11
Richmond, Va.	13.7	5	18.7	20.7	12.7
Roanoke, Va.	15	5	20	22	14
Petersburg, Va.	14.3	5	19.3	21.3	13.3
Charleston, W. Va.	14.5	4	18.5	20.5	12.5
Keyser, W. Va.	15.1	4	19.1	21.1	14.1
Parkersburg, W. Va.	13.2	4	17.2	19.2	11.2
Wheeling, W. Va.	14.4	4	18.4	20.4	12.4
Charlotte, N. C.	14.3	5	19.3	20.3	14.3
Hickory, N. C.	15.8	5	20.8	22.8	14.8
Mt. Airy, N. C.	15.5	5	20.5	22.5	14.5
Salisbury, N. C.	15.7	5	20.7	20.7	14.7
Charleston, S. C.	13.3	6	19.3	21.3	12.3
Columbia, S. C.	15.2	6	21.2	23.2	14.2

Note: 2c per gallon discount off t.w. price of gasoline to dealers and commercial consumers thru S. O. New Jersey territory.

CONTINENTAL OIL

Denver, Colo.	12	4	16	18	15.5
Pueblo, Colo.	14	4	18	19	15.5
Grand Junc., Colo.	18	4	22	25	19
Casper, Wyo.	14	4	18	21	14
Cheyenne, Wyo.	15.5	4	19.5	22.5	15.5
Butte, Mont.	18.5	5	23.5	26.5	20
Helena, Mont.	18.5	5	23.5	26.5	20
Salt Lake City, Utah	16.5	3½	20	20	17
Boise, Ida.	18.5	5	23.5	26.5	19
Twin Falls, Ida.	18.5	5	23.5	27.5	19
Albuquerque, N. M.	15	5	20	22	17

S. O. CALIFORNIA

			*Plant		
Phoenix, Ariz.	14	4	18	22	20
Los Angeles, Cal.	16.5	3	19.5	22.5	15.5
Fresno, Cal.	17	3	20	23	17
San Francisco, Cal.	17	3	20	23	15.5
Reno, Nev.	21	4	25	28	19
Portland, Ore.	15.5	4	19.5	22.5	16.5
Seattle, Wash.	15.5	3	18.5	21.5	16.5
Spokane, Wash.	19.5	3	22.5	25.5	20.5
Tacoma, Wash.	15.5	3	18.5	21.5	16.5

Note: 4c per gal. discount to dealers off t.w. price of gasoline to customers taking tank truck delivery, thru S. O. California territory except 1c discount at Phoenix to dealers only.

*Prices in the fourth column represent retail sale prices of gasoline for delivery into fuel tanks of customers' automotive equipment at S. O. California refineries, terminals and district depots as this company operates no retail service stations.

S. O. LOUISIANA

Little Rock, Ark.	11	5	16	16	13
Alexandria, La.	‡12	4	‡16	18	†14
Baton Rouge, La.	11	4	15	16	†14
Lake Charles, La.	††12	4	††16	††18	†14
New Orleans, La.	*11	4	*15	15	†12
Shreveport, La.	11	4	15	17	†14
Lafayette, La.	**13	4	**17	**19	†14
Bristol, Tenn.	14	5	19	21	14
Chattanooga, Tenn.	14	5	19	20	13
Knoxville, Tenn.	14	5	19	20	16
Nashville, Tenn.	13	5	18	20	16
Memphis, Tenn.	12	5	17	19	12.5

Note: 2c per gallon discount off t.w. price of gasoline to dealers thru S. O. Louisiana territory.

*New Orleans gasoline prices include 1c parish tax in addition to 4c state tax, and kerosene prices include 1c state tax and 1c parish tax.

†Kerosene price in Louisiana includes 1c state tax.

**Lafayette gasoline prices include 1c parish tax in addition to 4c state tax.

††Lake Charles gasoline prices include 1c parish tax.

‡Alexandria gasoline prices include 1c parish tax.

S. O. KENTUCKY

Ashland, Ky.	14	5	19	21	15
Catlettsburg, Ky.	14	5	19	21	15
Lexington, Ky.	13	5	18	20	14.5
Louisville, Ky.	14	5	19	21	13
Covington, Ky.	14	5	19	20	14.5
Clarksdale, Miss.	13	5	18	20	12.5
Gulfport, Miss.††	15.5	5	20.5	22.5	13
Jackson, Miss.	14	5	19	21	13
Natchez, Miss.	13.5	5	18.5	20.5	13
Vicksburg, Miss.	13.5	5	18.5	20.5	13
Birmingham, Ala.‡‡	16	4	20	22	14.5
Mobile, Ala.‡	13	4	17	17	13.5
Montgomery, Ala.*	16	4	20	22	15

Latest Changes in Tank Wagon Prices

Gasoline

S. O. New Jersey—T.w. cut 1c, s.s. 2c, Charlotte, to 19.3c and 20.3c, including 5c tax, **Mar. 29.**

S. O. Kentucky—T.w. and s.s. cut 2c, Augusta, to 19c and 21c, including 6c tax, **Mar. 29.**

S. O. Louisiana—S.s. only up 1c, Baton Rouge, to 16c, **Apr. 1.**

Magnolia Petroleum—T.w. up 2c, s.s. 3c, Muskogee, to 16c and 19c, including 4c tax, **Mar. 26.**

T.w. and s.s. cut 2c, Little Rock, both to 16c, including 5c tax, **Mar. 29.**

T.w. and s.s. cut 2c, Texarkana, to 13c and 15c, including 4c tax, **Mar. 26.**

Canada—T.w. and s.s. gasoline advanced 2c, British Columbia, covering tax increase to 5c, **Apr. 1.**

Kerosene

Magnolia Petroleum—Kerosene cut 1c, El Paso, to 13c, t.w., **Mar. 20.**

	Gasoline		Total		Oil
	T.W.	Tax	T.W.	S.S.	T.W.
Atlanta, Ga.	14	6	20	22	†15.5
Augusta, Ga.	13	6	19	21	†15.5
Macon, Ga.	15	6	21	23	†14
Savannah, Ga.	14	6	20	22	†14
Jacksonville, Fla.	14	6	20	22	14
Miami, Fla.	15	6	21	23	14
Tampa, Fla.	14	6	20	22	13
Pensacola, Fla.**	12	6	18	20	13.5

Note: Net price of gasoline to dealers is 2c under posted t.w. price thru S. O. Kentucky territory.

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

†Georgia kerosene prices include 1c state tax.

**Both tank wagon prices include 1c city tax at Pensacola which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

‡Mobile gasoline prices include 1c city tax.

‡‡Birmingham gasoline prices include 1c city tax.

S. O. NEBRASKA

Omaha, Neb.	14.25	4	18.25	20.25	13.25
McCook	15.75	4	19.75	21.75	14.75
Norfolk	14.75	4	18.75	20.75	13.75
North Platte	15.75	4	19.75	21.75	14.50
Scottsbluff	15.75	4	19.75	21.75	14.25

S. O. INDIANA

Chicago, Ill.	14	3	17	18	13
Decatur, Ill.	14.2	3	17.2	18.2	13.1
E. St. Louis, Ill.	13.4	3	16.4	17.4	12.2
Joliet, Ill.	14.4	3	17.4	18.4	13.3
Peoria, Ill.	14.2	3	17.2	18.2	13.1
Quincy, Ill.	14.2	3	17.2	18.2	12.9
Indianapolis, Ind.	14.2	4	18.2	19.2	14.2
Evansville, Ind.	14	4	18	19	14
South Bend, Ind.	14.4	4	18.4	19.4	14.4
Detroit, Mich.	14.8	3	17.8	18.8	14.7
Grand Rapids, Mich.	14.7	3	17.7	18.7	14.6
Saginaw, Mich.	14.9	3	17.9	18.9	14.8
Green Bay, Wisc.	14.6	2	16.6	17.6	13.4
Madison, Wisc.	14.3	2	16.3	17.3	13.1
Milwaukee, Wisc.	14.1	2	16.1	17.1	12.9
La Cross, Wisc.	15.2	2	17.2	18.2	14
Minneapolis, Minn.	15.2	3	18.2	19.2	13.9
Duluth, Minn.	15.5	3	18.5	19.5	13.9
Mankato, Minn.	15.1	3	18.1	19.1	13.7
Des Moines, Ia.	14.5	3	17.5	18.5	13.3
Davenport, Ia.	14.5	3	17.5	18.5	13.3
Sioux City, Ia.	14.1	3	17.1	18.1	12.9
Mason City, Ia.	14.5	3	17.5	18.5	13.3
St. Louis, Mo.	*13.9	2	15.9	16.9	12.3
Kansas City, Mo.	†14.9	2	16.9	17.9	11.6
St. Joseph, Mo.	†14.5	2	16.5	17.5	12.2
Fargo, N. D.	16.9	3	19.9	20.9	15.9
Grand Forks, N. D.	17.2	3	20.2	21.2	16.2
Minot, N. D.	16.9	3	19.9	20.9	15.9
Pierre, S. D.	15	4	19	20	14.4
Huron, S. D.	15.3	4	19.3	20.3	14.7
Wichita, Kans.	12.8	3	15.8	14.8	11.8
Bartlesville, Okla.	12.5	4	16.5	17.5	11.5

S. O. Indiana's quantity contract price schedule thru territory (except in Chicago and Detroit, which see below) on tank truck deliveries of gasoline, figured from the service station price is 2c for 500 gals. or more a month; 2½c for 2,000 gals. or more a month; 3c for 6,000 gals. or more a month; and 4½c for 100,000 gals. or more a month.

In Chicago and vicinity, these discounts apply: Over 500 gals. per month, 2c per gal. off service station price; over 1,000 gals. per month, 4c per gal. off service station price; over 50,000 gals. per month, 4½c per gal. off s.s. price; over 75,000 gals., 5c off.

In Detroit, dealers and consumers signing contract for all gasoline for one year, get 4c per gal. off s.s. price. Non-contracted accounts get 3c off s.s. price. Those buying 100,000 gals. or more a month, 4½c per gal. off s.s. price.

*Includes city tax of ½c.

†Includes city tax of 1c.

S. O. OHIO

Ohio state-wide	14	4	18	19	12
†Darke, Hancock, Preble and Scioto Counties	13	4	17	17	†12
Athens County	11	4	15	15	12

Note: Discount to dealers and commercial accounts generally thru Ohio is 2c per gal. off t.w. price with some exceptions. In counties where prices are below normal, discount is 3c per gal. off t.w. price.

†Kerosene t.w. price in Darke County is 10c; in Paulding County 11c.

MAGNOLIA PETROLEUM

Muskogee, Okla.	12	4	16	19	10
Oklahoma City	11	4	15	18	10
Tulsa, Okla.	11	4	15	19	10
Fort Smith, Ark.†	10	†4	14	16	12
Little Rock, Ark.	11	5	16	16	13
Texarkana, Ark.*	9	*4	13	15	12
Dallas, Tex.	12	4	16	20	12
Fort Worth, Tex.	12	4	16	19	12
Houston, Tex.	11	4	15	19	11
San Antonio, Tex.	11	4	15	19	11
El Paso, Tex.	12	4	16	20	13

*Within city of Texarkana, the state tax on gasoline is 4c per gal. conforming with the Texas state tax. In this district outside of the city the 5c Arkansas tax applies.

†Within city of Fort Smith, Oklahoma tax of 4c applies. In this district outside of the city, the 5c Arkansas tax applies.

S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings	12.3	2	14.3	16.3	11.3
Borough of Richmond	12.7	2	14.7	16.7	11.7
Albany, N. Y.	13.6	2	15.6	17.6	12.6
Buffalo, N. Y.	11.8	2	13.8	15.8	11.8
Rochester, N. Y.	12	2	14	16	12
Syracuse, N. Y.	11.8	2	13.8	15.8	12.8
Boston, Mass.	12.5	2	14.5	16.5	11.5
Augusta, Me.	13.8	4	17.8	19.8	12.8
Manchester, N. H.	13.4	4	17.4	19.4	12.4
Burlington, Vt.	14.3	4	18.3	20.3	13.3
New Haven, Conn.	13.6	2	15.6	17.6	12.6
Providence, R. I.	12.7	2	14.7	16.7	11.7

Note: S. O. New York allows 3c off t.w. price to dealers in New York City, and 2c off t.w. price thru rest of territory.

ATLANTIC REFINING

Pittsburgh, Pa.	15	*	15	21	13
Philadelphia, Pa.	15	*	15	21	13
Allentown, Pa.	15	*	15	21	13

Above prices include these inspection fees on both gasoline and kerosene, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosene; Arkansas, 1/20c on both; Florida, 1/8c on both; Georgia, 1/10c on both; Illinois, 3/100c on both; Indiana, 4/25c to 1/2c on both; Kansas, 3/50c on both; Louisiana, 1/32c on gasoline; Minnesota, 3/50c on both; Missouri, 3/10c to 1/2c on both; Nebraska, 3/100c on both; North Carolina, 1/4c on both; North Dakota, 1/20c on both; Oklahoma, 4/25c on both; South Carolina, 1/8c on both; South Dakota, 1/10c on both; Tennessee, 2/5c on gasoline and 1/2c to 4/5c on kerosene; Wisconsin, 3/50c on both. Kerosene inspection fees only, per gallon; Iowa 7/100c; Michigan 1/5c to 4/5c per gal.

Tank Wagon, Service Station Markets for Gasoline and Kerosene

Prices in Effect Apr. 7, 1930

ATLANTIC REFINING

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Erie, Pa.	15	*	15	19	13
Scranton, Pa.	15	*	15	21	13
Altoona, Pa.	15	*	15	21	13
Dover, Del.	15	3	18	20	13
Wilmington, Del.	15	3	18	20	13
Boston, Mass.	12.5	2	14.5	16.5	11.5
Springfield, Mass.	13.5	2	15.5	17.5	12.5
Worcester, Mass.	13.3	2	15.3	17.3	12.3
Fall River, Mass.	13.1	2	15.1	17.1	12.1
Providence, R. I.	12.7	2	14.7	16.7	11.7
Hartford, Conn.	13.5	2	15.5	17.5	12.5
New Haven, Conn.	13.6	2	15.6	17.6	12.6
Atlantic City, N. J.	14.5	2	16.5	18.5	13.5
Camden, N. J.	13.6	2	15.6	17.6	12.6
Trenton, N. J.	14	2	16	18	13
Annapolis, Md.	14	4	18	20	13
Baltimore, Md.	13.2	4	17.2	19.2	10.5
Hagerstown, Md.	14.7	4	18.7	20.7	13.7
Richmond, Va.	13.7	5	18.7	20.7	12.7
Wilmington, N. C.	13.4	5	18.4	20.4	12.4
Brunswick, Ga.	14	6	20	22	**15
Jacksonville, Fla.	14	6	20	22	14

Note: 2c per gal. discount off t.w. price of gasoline on sales to dealers; discount to commercial accounts under contract for one year in accordance with Code of Ethics.

*4-cent state tax is collected by retail dealer and paid by him directly to state.

**Georgia kerosene prices include 1c state tax.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	14.7	16.7	17
Detroit	17.4	18.9	20.7
Kansas City	†15.9	†17.4	†19.2
Milwaukee	16.4	*19.9	*21.7
Minneapolis	**20.7	**22.2	**24
St. Louis	15.6	17.1	18.9
New York		16	23
Boston		19	23

*Includes 2c state tax. †Includes 1c city tax.
**Includes 3c state tax.

Petroleum Spirits (Solvent)

Tank Cars (F.o.b. refinery or seaboard terminal)	
New York harbor	11.00
Philadelphia district	11.00
Providence	11.50
Tank Wagon or Steel Barrels	
New York City	18
Syracuse	17–18
Rochester	18
Buffalo	17–18
Providence	19
Boston	19
Bridgeport	16–18
Newark	18
Philadelphia	16
Baltimore	18

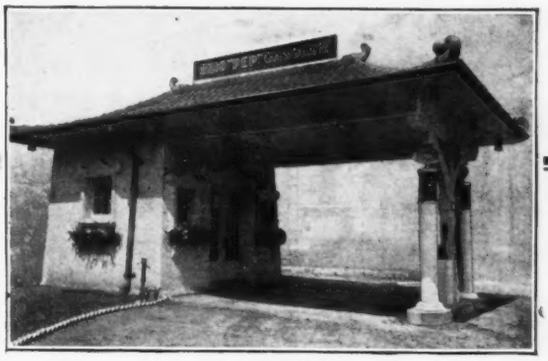
Note: 2c off above t.w. prices to large buyers in some instances.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Toronto	19.5	5	24.5	28	20.5
Ottawa	19.5	5	24.5	28	20.5
North Bay	22.5	5	27.5	33	27
Ft. William	22.5	5	27.5	31	22.5
Border Cities, including Windsor	18.5	5	23.5	27	19.5
MANITOBA					
Winnipeg	21.5	3	24.5	28	21.5
SASKATCHEWAN					
Regina	26	3	29	33	26
ALBERTA					
Edmonton	27.5	5	32.5	36	27.5
Calgary	23.5	5	28.5	32	23.5
BRITISH COLUMBIA					
Vancouver	23	5	28	32	24
QUEBEC					
Montreal	20.5	5	25.5	29	21.5
Quebec City	21.5	5	26.5	30	22.5
Three Rivers	21.5	5	26.5	30	22.5
NEW BRUNSWICK					
St. John	22	5	27	31	24
Moncton	22	5	27	31	24
NOVA SCOTIA					
Halifax	22	5	27	31	24
PRINCE EDWARD ISLAND					
Charlottetown	22	5	27	31	24

Note: In districts surrounding these points 1c additional is added to city price.



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Filling Station

Beautiful oriental style architecture, massive metal tile roof, handsome embossed metal side walls and ceilings. Planned for utmost beauty, convenience and economy. Constructed of stucco on galvanized metal lath and ready-cut wood. Easy to erect, fire-proof, permanent.

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524-544 Eggleston Ave. Cincinnati, Ohio

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"If you were to wire me for Mid-Continent gasoline prices today, I would phone a member of the OILGRAM staff, and my reply to you would be the *gist of what he told me*. The OILGRAM staff is in direct and close contact with the markets almost every hour of the business day. *They know their business.*"

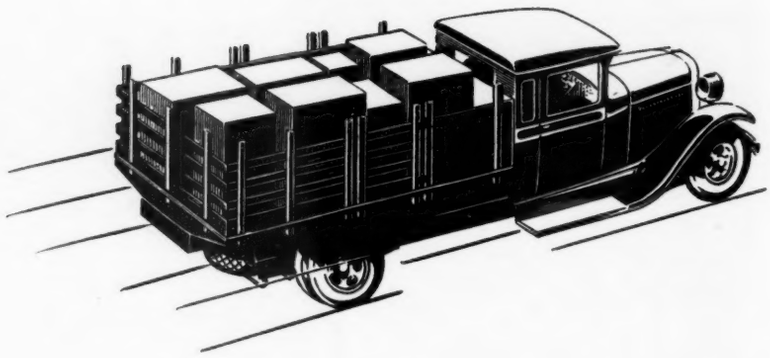
You too, can have the benefit of this close contact with all phases of the market at all the principal refining and marketing centers.

The service costs only $65 for 6 months, or $100 a year, payable in advance. Approximately 40 cents a day—less than the cost of one wire or one phone call.

Avail yourself of this fast, daily market service today—send your order with check to the nearest mailing point.

TULSA—904 World Bldg.
CHICAGO—35 East Wacker Drive
NEW YORK—342 Madison Avenue
CLEVELAND—1213 West Third St.

More profit per load hauled



There is a compelling reason for the universal use of Dodge Trucks—a compelling reason why thousands engaged in the oil industry use them—a compelling reason why one will be a profitable investment for you . . . These workers haul at low cost and therefore increase the profits of their owners.

How Dodge Trucks lower hauling costs is noonday clear to users. They are speedy in get-away and on the open road—they are time-savers. They are dependable—work faithfully with the minimum of time off and minimum need for upkeep. They serve at low cost and serve long. They are good-looking—goodwill builders. They please drivers by their comfort and performance—increase driver efficiency.

For proof that a Dodge Truck will lower your hauling costs, see your Dodge Brothers dealer. Inspect the type that fits your needs. Buy it complete with body. Count on greater savings per load hauled, greater profit.

DODGE TRUCKS

Crude Oil Prices (in Effect April 7, 1930)

(Crude prices for the whole year in OIL PRICE HANDBOOK published annually)

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)
(All Penna. Grade Crude Effective Feb. 17, 1930)

†Bradford—Alleghany district.....$3.00
Bradford District Oil in New York Transit Lines (Bradford District).....††$2.75
Bradford District Oil in National Transit Lines (Bradford District).....††2.75
Penna. Grade Oil in National Transit Lines (Other Pennsylvania).....*2.80
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)..... 2.75
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)..... 2.65
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)..... 2.45
Wayne district crude in Cumberland lines (West Virginia)..... 1.24
Corning Grade in Buckeye Pipe Lines (Ohio) (Effective Feb. 17, 1930)..... 1.65
Corning, O., heavy grade (Effective Feb. 17, 1930) 1.55
Somerset Oil in Cumberland Pipe Lines (Kentucky) (Effective Feb. 17, 1930).... 1.37
Somerset Oil in Eureka Pipe Lines (Effective Feb. 17, 1930)..... 1.21
Ragland Grade in Cumberland Pipe Lines (Kentucky) (Effective Jan. 29, 1929)....$0.60

*Oil run prior to July 1, 1929 is $2.75 per bbl.
†Posted by Tide Water Pipe Co., Ltd.
††Oil run prior to July 1, 1929 is $2.70 per bbl.

(Posted by Stoll Oil Refining Co.)

Oil City, Ky., oil in Stoll lines (Effective Feb. 19, 1930).....$1.45

MICHIGAN

(Posted by Dixie Oil Co.)

Traverse and Dundee (Muskegon):

32-32.9	$1.08	39-39.9	$1.29
33-33.9	1.11	40-40.9	1.32
34-34.9	1.14	41-41.9	1.35
35-35.9	1.17	42-42.9	1.38
36-36.9	1.20	43-43.9	1.41
37-37.9	1.23	44 and above	1.44
38-38.9	1.26		

(Posted by Pure Oil Co.)

Midland, Midland County.....$1.25

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.
Effective Feb. 15, 1930

Wooster	$1.75	Princeton	$1.60
Lima	1.65	Illinois	1.60
Waterloo	1.20	Plymouth	1.18
Indiana	1.42	West Kentucky	1.50

CANADIAN CRUDE

Posted by Imperial Oil Refineries, Ltd.

Petrolia.....$2.05
Oil Springs..... 2.12

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of Prairie Oil & Gas Co.
(In Oklahoma, Kansas, North and East Central Texas)
Effective Feb. 15, 1930

Below 25	$0.60	35-35.9	$1.17
25-25.9	0.66	36-36.9	1.20
26-26.9	0.72	37-37.9	1.23
27-27.9	0.78	38-38.9	1.26
28-28.9	0.84	39-39.9	1.29
29-29.9	0.90	40-40.9	1.32
30-30.9	0.96	41-41.9	1.35
31-31.9	1.02	42-42.9	1.38
32-32.9	1.08	43-43.9	1.41
33-33.9	1.11	44 and above	1.44
34-34.9	1.14		

Above prices were posted by Humble and The Texas Co. on Jan. 15; on Jan. 16 by Magnolia in Texas, and Jan. 17 in Oklahoma and Kansas; and on Feb. 13 by Sinclair; by Carter Oil on Jan. 16.

Humble Oil & Refining Co. Prices

(Ranger, North Texas, Mexia, Powell, Boggy Creek, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)

Humble's prices in above fields same as Prairie's, but effective Jan. 15, 1930

Magnolia Petroleum Co.
(In Oklahoma, Kansas and North and East Central Texas)

Magnolia posts in above fields and in Panola Co., same schedule as Prairie, which see. Its postings in Texas were effective Jan. 16, and in Oklahoma and Kansas, Jan. 17, 1930.

Jan. 16, 1930, Glasscock, Crane, Upton, Winkler, Howard and Mitchell Counties same prices as Humble's postings in Winkler, Crane, etc., which see.

Iatan district	$0.93
Corsicana heavy	0.75
Luling	0.75
Mirando	0.75
Darst Creek, 60° F. gravity	1.05

Carter Oil Co.
(Oklahoma and Kansas)

Jan. 16, 1930, same schedule as Prairie, which see.

PANHANDLE, TEXAS

Humble Oil & Refining Co.
Effective Jan. 15, 1930

Hutchinson and Carson Counties:

Below 32	$0.72	38-38.9	$0.96
32-32.9	0.78	39-39.9	0.99
33-33.9	0.81	40-40.9	1.02
34-34.9	0.84	41-41.9	1.05
35-35.9	0.87	42-42.9	1.08
36-36.9	0.90	43-43.9	1.11
37-37.9	0.93	44 and above	1.14

Wheeler County:

Below 30	$0.70	37-37.9	$1.03
30-30.9	0.76	38-38.9	1.06
31-31.9	0.82	39-39.9	1.09
32-32.9	0.88	40-40.9	1.12
33-33.9	0.91	41-41.9	1.15
34-34.9	0.94	42-42.9	1.18
35-35.9	0.97	43-43.9	1.21
36-36.9	1.00	44 and above	1.24

Gray County:

Below 29	$0.69	37-37.9	$1.08
29-29.9	0.75	38-38.9	1.11
30-30.9	0.81	39-39.9	1.14
31-31.9	0.87	40-40.9	1.17
32-32.9	0.93	41-41.9	1.20
33-33.9	0.96	42-42.9	1.23
34-34.9	0.99	43-43.9	1.26
35-35.9	1.02	44 and above	1.29
36-36.9	1.05		

Above prices met by The Texas Co. on Jan. 15, and Magnolia on Jan. 16.

WEST TEXAS

Humble Oil & Refining Co.
Effective Jan. 15, 1930

Winkler, Crane, Upton, Crockett, *Ector, and Pecos Counties, also Lea County, N. Mex.

Below 25	$0.55	31-31.9	$0.76
25-25.9	0.58	32-32.9	0.79
26-26.9	0.61	33-33.9	0.82
27-27.9	0.64	34-34.9	0.85
28-28.9	0.67	35-35.9	0.88
29-29.9	0.70	36 and above	0.91
30-30.9	0.73		

*Ector County prices begin April 1.

Howard and Glasscock counties:
Effective Jan. 15, 1930

Below 25	$0.55	31-31.9	$0.72
25-25.9	0.58	32-32.9	0.74
26-26.9	0.61	33-33.9	0.76
27-27.9	0.64	34-34.9	0.78
28-28.9	0.66	35-35.9	0.80
29-29.9	0.68	36 and above	0.82
30-30.9	0.70		

Jan. 15, 1930, The Texas Co. posted same prices in Crane, Upton, Winkler and Lea, and Magnolia, on Jan. 16, in Crane, Upton, Winkler, Glasscock, Howard and Mitchell as Humble in Winkler, Crane etc.

SOUTH AND SOUTHWEST TEXAS

(Posted by Humble Oil & Refining Co.)
Effective Jan. 15, 1930

Mirando	$0.75
Salt Flat	1.05
Darst Creek	1.05
Pettus, Bee County (April 1)	1.30

NORTH LOUISIANA—ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana

Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton, De Soto, Sabine and **Cotton Valley.
Effective Jan. 16, 1930

Below 28	$0.78	36-36.9	$1.20
28-28.9	0.84	37-37.9	1.23
29-29.9	0.90	38-38.9	1.26
30-30.9	0.96	39-39.9	1.29
31-31.9	1.02	40-40.9	1.32
32-32.9	1.08	41-41.9	1.35
33-33.9	1.11	42-42.9	1.38
34-34.9	1.14	43-43.9	1.41
35-35.9	1.17	44 and above	1.44

**Cotton Valley, below 36, $0.80. Beginning with 36-36.9, same schedule as above.

Smackover, below 24	$0.85		
do 24 and above	1.00		
Bellevue (Jan. 16, 1930)	1.05		
*Urania, La. (Jan. 16, 1930)	0.85		
†East El Dorado	0.75		

*Posted by Louisiana Oil Refining Corp.
†Posted by Magnolia Petroleum Co.

Jan. 15, 1930, The Texas Co. same schedule in Louisiana as Standard, plus these grades: 24-24.9, $0.60; 25-25.9, $0.66; 26-26.9, $0.72; 27-27.9, $0.78.

Jan. 16, Magnolia, Louisiana Oil, and Gulf Companies met Standard schedule in Louisiana-Arkansas fields.

STEPHENS, ARKANSAS

Louisiana Oil Refining Corp., and Atlantic Oil Producing Co.
Effective Jan. 16, 1930

Below 28	$0.70	30-30.9	$0.85
28-28.9	0.75	31-31.9	0.90
29-29.9	0.80	32 and above	0.95

GULF COASTAL

Posted by Humble Oil & Refining Co.
Effective Jan. 15, 1930

Grades A	$1.05	34-34.9	$1.20
Grades B:		35-35.9	1.23
Below 25	0.90	†36-36.9	1.26
25-25.9	0.93	37-37.9	1.29
26-26.9	0.96	38-38.9	1.32
27-27.9	0.99	39-39.9	1.34
28-28.9	1.02	40-40.9	1.36
29-29.9	1.05	41-41.9	1.38
30-30.9	1.08	42-42.9	1.40
31-31.9	1.11	43-43.9	1.42
32-32.9	1.14	44 and above	1.44
33-33.9	1.17		

*Refugio county	(rest of schedule, same as Grades B, which see above).
Below 25 $0.75	
25-25.9 0.93	

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia Orange, Boling, Humble, Pierce Junction, Sugarland and Raccoon Bend. All other fields are Grades A only.

†Beginning with 36-36.9, prices effective Apr. 1, 1930.

*Posted Apr. 1, 1930.

Crude Price Changes

HOUSTON—On April 1 Humble Oil & Refining Co. added nine new grades of light oils to its Gulf Coastal "B" crude, beginning with 36-36.9 gravity up to maximum gravity of 44 and above, thus meeting the gravity schedule on light crudes first posted by The Texas Co. on June 8, 1926.

Humble's price schedule meets that of The Texas Co. which that company posted on Jan. 15 last. The schedule begins with a price of $1.26 for 36-36.9 gravity, with a 3 cent differential up to 38-38.9, which is $1.32 and a 2 cent differential for each succeeding degree of gravity up to top grade of 44 and above, which is $1.44 per barrel. The Humble had been posting $1.23 for all crude 35 and above.

Grades "A" remain unchanged at $1.05.

On the same date Humble made four initial crude postings, including Pettus crude in Bee county, Ector county crude, Humble field and Refugio county crude.

It posted $1.30 per barrel for Pettus; placed Ector county on the same price and gravity basis as Crane, Upton, Winkler and other West Texas crudes; added Humble field to its Gulf Coastal "B" postings, also Refugio county, only that its price for below 25 gravity in Refugio is 75 cents. Other grades are the same as Gulf Coast "B" grades.

NEW YORK—W. H. Ferguson, Continental Oil Co., Denver, has been appointed chairman of the Rocky Mountain Region Code Committee of the American Petroleum Institute's Division of Marketing, according to Henry B. Dawes, Pure Oil Co., Chicago, and chairman of the division.

Mr. Ferguson succeeds F. C. Cramer, Denver Powerine Co., Denver, resigned.

STEEL BARRELS

The Light Gauge Barrel (illustrated) has a deeper chime and higher hoops for extra strength and easy handling.

P.I.W.
STEEL BARRELS

ALL the standard types of steel barrels from the Light Gauge package illustrated to the I.C.C. and special containers are offered by P.I.W.

Sizes range from 15 to 110 gallons and finishes include baked enamel in any color combination or hot-dip galvanized or tinned.

Your own trade mark or slogan reproduced on an attractively decorated head or shell is available at slight extra cost.

Straight line mass production methods assure quick shipments on short notice.

In other words P.I.W. steel barrel service is complete. The nearest office will gladly submit a quotation.

THE PETROLEUM IRON WORKS COMPANY

SHARON, PA.

NEW YORK CHICAGO TULSA

P.I.W.
STEEL BARRELS

Crude Oil Prices (in Effect April 7, 1930)

(Prices are per barrel at the well)

(Crude Oil Prices for the whole year in OIL PRICE HANDBOOK published annually)

GULF COASTAL

Prices of The Texas Co.

Effective Jan. 15, 1930

Grades A	$1.05	*Grades B	$0.90
‡Grades B (light crude)			
35–35.9	$1.23	40–40.9	$1.36
36–36.9	1.26	41–41.9	1.38
37–37.9	1.29	42–42.9	1.40
38–38.9	1.32	43–43.9	1.42
39–39.9	1.34	44 and above	1.44

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on all oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS

Prices of Ohio Oil Co., and Midwest Refining Co.

(Salt Creek prices effective Feb. 15, 1930)

‡Salt Creek 29–29.9	$0.90
" " 30–30.9	0.96
" " 31–31.9	1.02
" " 32–32.9	1.08
" " 33–33.9	1.11
" " 34–34.9	1.14
" " 35–35.9	1.17
" " 36–36.9	1.20
" " 37 and above	1.23
Elk Basin	1.45
Grass Creek light	1.45
Big Muddy	$1.33
Lance Creek	1.53
Rock Creek	1.25
Mule Creek	1.20
Rex Lake	1.10
‡Osage	1.53
‡Cat Creek, Mont.	1.45
Sunburst, Mont.	1.65
‡Hogback, N. Mex.	1.40
Artesia, N. Mex.	1.00

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

CALIFORNIA

Standard Oil Co. of California

(Effective March 11, 1930)

Gravity	Signal Hill Seal Beach Alamitos Heights Huntington Beach Inglewood* Olinda-Brea Canon*	Athens Rosecrans Dominguez	Elwood Terrace	Torrance Richfield	Whittier La Habra	Montebello	Coyote	Santa Fe Springs	Newhall McKittrick Kern River	Midway-Sunset Elk Hills Buena Vista Hills Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills	Orcutt (Santa Maria) (Union Oil Co.)	Santa Paula (Ventura) (Union Oil Co.)	Ventura Avenue (Associated Oil Co.)
14–14.9**	$0.70	....	....	$0.70	$0.70	$0.70	$0.70	....	$0.55	$0.55	$0.55	$0.55	....	$0.55	$0.70	$0.70
15–15.9	.70	....		.70	.70	.70	.70	....	.55	.55	.55	.55		.55	.70	.70
16–16.9	.70	....		.70	.70	.70	.70	....	.55	.55	.55	.55	$1.65	.55	.70	.70
17–17.9	.70	....		.70	.70	.70	.70	....	.55	.55	.55	.55	for	.55	.70	.70
18–18.9	.76	....		.76	.76	.71	.76	....	.55	.62	.62	.62	55°	.65	.75	.76
19–19.9	.82	....	F. o. b. ship	.82	.82	.77	.82	....	.55	.70	.70	.70	gravity	.70	.80	.82
20–20.9	.88	....		.88	.87	.83	.87	....	....	.78	.78	.78	and	.78	.85	.88
21–21.9	.94	....		.94	.93	.90	.93	.92	....	.86	.86	.86	over	.90	.90	.91
22–22.9	1.00	....	....	1.00	.98	.97	.98	.95	....	.94	.94	.94	....	.95	.97	.94
23–23.9	1.07	....	....	1.07	....	1.05	1.04	1.01	....	1.02	1.02	1.02	....	1.02	1.05	1.00
24–24.9	1.14	1.14	....	1.14	....	1.11	1.10	1.07	....	1.09	1.07	1.07	....	1.10	1.08	1.07
25–25.9	1.21	1.19	....	1.21	....	1.17	1.16	1.13	....	1.16	1.12	1.12	....	1.18	1.13	1.14
26–26.9	1.28	1.24	....	1.28	....	1.23	1.23	1.19	....	1.23	1.17	1.17	....	1.26	1.18	1.21
27–27.9	1.35	1.29	....	1.35	....	1.29	1.30	1.25	....	1.30	1.23	1.22	....	....	1.23	1.28
28–28.9	1.42	1.34	....	1.42	....	1.35	1.37	1.31	....	1.35	1.27	....	....	....	1.28	1.35
29–29.9	1.46	1.39	....	†1.46	....	1.38	1.41	1.37	....	1.41	1.31	....	....	....	1.33	1.39
30–30.9	1.50	1.45	....	†1.50	....	1.41	1.45	1.43	....	1.47	1.35	....	....	....	1.39	1.43
31–31.9	1.55	1.51	....	....	....	....	....	1.49	....	1.53	1.39	....	....	....	1.45	1.48
32–32.9	1.60	1.57	....	....	....	....	....	1.55	....	1.59	1.43	....	....	....	1.51	1.53
33–33.9	....	1.64	....	....	....	....	....	1.60	....	1.65	1.47	....	....	....	1.58	1.59
34–34.9	....	1.71	1.32	....	....	....	....	1.65	....	††1.71	1.51	....	....	....	....	1.65
35–35.9	....	1.78	1.39	....	....	....	....	1.70	....	††1.77	1.55	....	....	....	....	1.71
36–36.9	....	1.84	1.46	....	....	....	....	1.75	....	....	....	....	....	....	....	....
37–37.9	....	1.90	1.53	....	....	....	....	1.80	....	....	....	....	....	....	....	....
38–38.9	....	1.96	1.60	....	....	....	....	1.85	....	....	....	....	....	....	....	....
39–39.9	....	2.02	1.66	....	....	....	....	1.90	....	....	....	....	....	....	....	....
40–40.9	....	2.08	1.72	....	....	....	....	....	....	....	....	....	....	....	....	....
41–41.9	....	2.14	1.78	....	....	....	....	....	....	....	....	....	....	....	....	....
42–42.9	....	2.20	1.84	....	....	....	....	....	....	....	....	....	....	....	....	....

*Inglewood prices run only to 28.9 gravity; Olinda-Brea Canon to 31.9 gravity.
†Richfield crude only. ††These two grades apply on Lost Hills only.
**Standard does not contract for crude testing below 14 gravity, but pays 45c per barrel when purchased

REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders effective on the date shown.

Refiners' Supplies

	Apr. 7	Mar. 31
Soda Ash light 58% bags, cwt.	$1.32	$1.32
Silicate of Soda 60 deg. drums, cwt.	$1.55	$1.55
Silicate of Soda 40 deg. tank cars, cwt.	$0.60	$0.60
Silicate of Soda 40 deg. drums cwt.	$0.80	$0.80
Sal Soda wks.	$1.00–1.05	$1.00–1.05
Caustic Soda 76% solid, cwt.	$2.90	$2.90
Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton	$11.00	$11.00
Oleum 20%, fuming sulfuric, tank cars, wks.	$18.50	$18.50
Sulfur, flowers of cwt.	$3.10–4.00	$3.10–4.00
Liquid Chlorine, tank cars, wks. lb.	3.50–5.00	3.50–5.00

Compounders' Supplies

	Apr. 7	Mar. 31
Vegetable Oils		
Linseed carloads, spot lb.	14.20	13.80
Tanks, spot	13.40	13.00
Soya Bean, Tank, coast, lb.	9.00–9.50	9.00–9.50
Oleic Acid		
Distilled, tanks lb.	9.25–9.50	9.25–9.50
Distilled, bbls. lb.	10.125–10.375	10.125–10.375
Saponified, tanks lb.	9.25	9.25
Saponified, bbls. lb.	10.125–10.625	10.125–10.625
Lard Oils		
Prime Winter Strained lb.	13.25	13.25
Extra Winter Strained lb.	12.00	12.00
Extra lb.	11.50	11.50
Extra No. 1 lb.	11.00	11.00
No. 1 lb.	10.50	10.50
No. 2 lb.	10.25	10.25
Tallow oil lb.	10.00	10.00
Neatsfoot Oil		
Pure, bbls. lb.	13.00	13.00
Extra, bbls. lb.	11.25	11.25
No. 1 bbls. lb.	11.00	11.00
Cold Pressed lb.	17.50	17.50
Fish Oils		
Menhaden Oil		
Light Pressed gal.	63–65	63–65
Light Pressed, tank cars, N. Y. gal.	53	53
White bleached gal.	67	67
Yellow bleached gal.	61	61
Whale, extra winter bleached, gal.	85	85
Naval Stores		
Steam, distilled turpentine, N. Y. gal.	51	51
Steam distilled turpentine, Savannah gal.	45	45
Gum turpentine, N. Y. gal.	56.50	56.50
Gum turpentine, f.o.b. cars Savannah gal.	53	53
Wood Rosin, N.Y. gal.	$7.30	$7.30
Wood Rosin F, Savn'h bbl.	$6.50	$6.50
Gum Rosin B, N. Y. bbl.	$7.60	$7.60
Gum Rosin B, f.o.b. cars Savannah bbl.	$6.50	$6.50
Rosin oil, pure gal.	58	58
Rosin oil, compounded gal.	58	58
Pine Tar		
Kiln burnt bbl.	$13.00–14.00	$13.00–14.00
Retort bbl.	$13.50–14.50	$13.50–14.50
Alcohol		
Denatured Formula 5, in bbls., per gal.	51–55	51–55

OIL STOCKS AND FINANCES

National Petroleum News

Late Reports Lower Average Gain In Oil Company Profits

CLEVELAND, April 5

REPORTS of nine more oil companies received the last week bring the percentage of gains in profits in 1929 over 1928 profits down to 24.6 per cent for a total of 72 oil and oil transportation companies. Reports on 63 companies, published in NATIONAL PETROLEUM NEWS for April 2, 1930, page 19, showed a gain of 27.6 per cent.

The nine additional companies reported a total gain of $2,028,339 or 4.1 per cent for 1929 over 1928. The decline in the more recent reports was due largely to a fall of earnings of the Vacuum Oil Co. of $1,892,831. Although the company does not so state, it is likely that Vacuum income was affected by the purchase of many Independent oil outlets by chain building companies, thereby closing many of the outlets the Vacuum previously had held. It also indicates why Vacuum has begun buying into Independent distributing and service station chains on a 51 per cent basis for Vacuum.

In spite of the decline the company continued a high rate of earnings, the net averaging $6.96 on each $25 par share as compared with $7.46 a share in 1928.

Amerada Corp. averaged $2.99 a share on 922,075 no par shares in 1929 as compared with $2.40 a share in 1928.

Chesebrough Mfg. Co. averaged $13.22 a share on 120,000 $25 par shares last year as compared with $10.58 a share the preceding year.

Cosden Oil Co. netted $4.65 a share on the average of 240,000 no par common shares outstanding during the year after dividends on the 7 per cent preferred stock and $3.72 a share on the 300,000 shares outstanding at the end of the year. The company did not operate all of 1928 and its report for that year covers operations from Feb. 4 to Dec. 31.

Panhandle Producing & Refining Co. earned $6.61 on 22,932 shares of $100 par 8 per cent cumulative preferred stock as compared with $3.19 on 26,366 shares of the preferred stock in 1928.

Skelly Oil Co. reported average net of $5.28 a share on 1,095,581 no par shares in 1929 and $3.76 a share on 1,089,570 shares in 1928.

More Earnings Reports

Company	1929	1928
Amerada Corp.	$2,758,900	$2,214,109
Chesebrough Mfg. Co.	2,189,280	1,720,523
Cosden Oil Co.	1,348,255	*769,991
General Asphalt Co.	1,757,095	920,506
North Central Texas Oil Co.	278,637	227,466
Paragon Refg. Co.	365,817	654,672
Panhandle Prod. & Refg. Co.	151,619	84,280
Skelly Oil Co.	5,786,490	4,104,376
Vacuum Oil Co.	35,767,627	37,659,458
Total	$50,383,720	$48,355,381
Gain in 1929	$2,028,339	or 4.1%
Total 63 companies reported in April 2, 1929 National Petroleum News	421,658,742	330,241,247
Total 72 companies	$472,042,462	378,596,628
Gain in 1929	$93,445,834	or 24.6%

*From Feb. 4 to Dec. 31, 1928.

S. O. Jersey-California Merger Prohibited

NEW YORK, April 5.—A merger of the Standard Oil Co. (N. J.) and Standard Oil Co. of California has been held by the U. S. Department of Justice as contrary to the Standard Oil dissolution decree of 1911.

An opinion was obtained from the department about a year ago when a merger of the two Standard Oil organizations was contemplated, John W. Davis, counsel for the New Jersey company, has revealed in a statement issued to deny rumors current in New York that a consolidation was pending. Mr. Davis' statement was:

"I was consulted about a year ago on the legal questions which should be considered if a merger of the business and assets of the Standard Oil Co. (N. J.) and Standard Oil Co. of California were to be discussed.

"Later, I addressed an inquiry to the Department of Justice at Washington as to the attitude of the department toward such a combination or merger. No contract or agreement had been entered into prior to this inquiry. The department expressed the opinion that such a merger was forbidden by the dissolution decree of 1911.

"Since the receipt of this intelligence, no further action looking to such a combination has been taken by either the New Jersey or the California company. There is no foundation for any stories to the contrary."

The New Jersey company has no operations in California and the California company has none east of Texas. Their operations would be largely supplementary except in part of Texas where crude production activities of their subsidiaries overlap.

The New Jersey company at the end of 1928 had assets, after depreciation, depletion and other reserves, that amounted to $1,572,267,610 and the California company to $589,989,632.

Denial was received here from Pittsburgh that Hope Natural Gas Co., New Jersey subsidiary, and other eastern gas companies were contemplating a great consolidation.

I. T. I. O. Offers Stock At $17 a Share

CLEVELAND, April 5.—Stockholders of the Indian Territory Illuminating Oil Co. have been offered the right to subscribe for one share of the new Class A non-voting no par common stock for each four shares of Class B no par stock they hold. Rights expire April 17 and subscriptions are to be paid in full by April 30. The price is $17 a share.

The Class B voting stock replaces the old I.T.I.O common stock of $1 a share par and of which there were 7,752,620 shares outstanding when the capital structure was changed.

It is expected that the offer will bring into the company approximately $30,000,000 which will be used for development and acquisitions including the purchase of the Foster Petroleum Co. which has production in the Oklahoma City field.

The new authorized capitalization consists of 5,500,000 shares of Class A stock and 9,500,000 shares of Class B.

ERIE Pa.,—Two hundred Erie Meter System gasoline pumps were bought by the Shell Petroleum Corp. for the 60 service stations it opened in Detroit Jan. 1, the "Erie Meter Dial," house organ of the Erie Meter System, Inc., says.

The Shell company previously had no stations in Detroit.

Why do so many Owners of Smaller Cars buy a top quality Oil like Waverly?

More than most others, the owner of a smaller car is likely to consider and protect the investment he has made in his car. He wants it to run as well and as long as possible. He knows, therefore, that he should use the very best motor oil he can buy.

To him as well as others, the name Waverly Motor Oil has become *a trustworthy guide to the utmost in oil.*

Half-a-century's experience in refining "All-Pennsylvania" oils is the background of that assurance. Added to this is Waverly's honest ambition to excel—to stand at the head of even the small select class of fine oils that are its only competitors.

As with other superior products, Waverly Motor Oil merits the slightly higher price you may pay—since it costs less in actual use—protects your car, and gives finer operating results.

The man who buys Waverly Motor Oil is, therefore, a careful, thoughtful, thrifty buyer. And he'll go a little out of his way, if necessary, to get Waverly. It is sold only by licensed dealers—and under a most unusual guarantee. Will you try Waverly next time you need oil, and judge its advantages for yourself?

1880 1930
FIFTY YEARS
of Faith, Effort and Ambition to Excel

WAVERLY OIL WORKS COMPANY
Pittsburgh, Pa.

Waverly

ALL-PENNSYLVANIA MOTOR OIL

35 *Cents a Quart*

THE THIRD OF A NEW AND Distinctive Series of WAVERLY ADVERTISEMENTS FOR 1930 IN THE *SATURDAY EVENING POST*

Transactions in Oil Shares on New York Stock Exchange

1928 High	1928 Low	1929 High	1929 Low	Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended April 5 Sales	First	High	Low	Last	Change
43¼	27½	42⅝	17½	(sh) 992,075	N.P.	Amerada Corp.	50cQ	Jan. 31, 30	17,400	29	29	26¾	27	— 2
85	51¼	64⅜	12½	(sh) 209,180	N.P.	American Republics Corp.	....	.....	7,900	36	36½	33½	34¾	— ⅛
53¾	37½	47¼	32½	$56,000,000	$25	Associated Oil.	50cQ	Dec. 31, 29	40	...	45	44	44	0
62½	50	77⅞	30	50,000,000	25	Atlantic Refining.	‡25cQ	Mar. 15, 30	111,000	47⅞	50⅞	47⅞	49⅞	+ 2⅛
53	20	49⅛	20	47,261,125	25	Barnsdall Corp. A.	50cQ	Feb. 7, 30	114,000	31⅞	33½	30⅝	33	+ 1⅛
51¾	20	49	38⅛	300,525	25	do B.	50cQ	Feb. 7, 30	.....	.....	.....	.....	.....	.....
24½	12¼	32⅞	13	(sh) 956,075	N.P.	Beacon Oil.	....	.....	5,200	15⅞	16⅞	15⅞	16⅝	+ 1⅛
36	25¼	34½	25	$51,524,150	$25	California Petroleum.	....	Jan. 1, 29	.....	.....	.....	.....	.....	.....
.....	....	37¾	18	(sh) 4,634,163	N.P.	Continental Oil (Delaware).	....	.....	107,900	27⅛	29¼	26½	29⅛	+ ⅛
94⅞	68	94¾	42¼	21,031,400	100	General Asphalt.	$1Q	Mar. 15, 30	45,600	66⅜	69½	65	69¼	+ 2½
141	110½	138	103½	6,628,200	100	do pfd.	$1.25Q	Dec. 2, 29	.....	.....	.....	.....	.....	.....
67	79	109	23	25,000,000	100	Houston Oil.	....	.....	62,000	102	105½	98	102⅞	+ 9⅛
38⅜	21¾	39¼	17¾	(sh) 1,333,157	N.P.	Independent Oil & Gas.	50cQ	Jan. 31, 30	127,400	29¼	31¾	28¾	30½	+ 1⅞
39⅜	9	53	13	$4,299,190	$10	Indian Refining.	....	Dec. 15, 20	76,800	24⅜	24¾	23⅛	24¼	+ ¼
37¼	8½	51¼	11½	4,550,110	10	do ctfs.	.....	.....	25,400	22⅛	23⅛	21	22¾	+ ⅝
185	140	165	160	1,977,700	100	do pfd. new.	$1.75Q	Jan. 1, 30	.....	.....	.....	.....	.....	.....
39½	27⅜	38⅜	16½	3,992,387	N.P.	Lago Oil & Transport.	....	May 2, 27	1,000	24	25	24	25	+ 1
119¾	9⅜	18	7	(sh) 1,187,298	N.P.	Louisiana Oil Refining.	....	.....	10,500	9⅞	11¼	9¾	9⅞	0
96	78	100¼	80	$4,000,000	$100	do pfd.	$1.62½	Feb. 15, 30	40	89	89	89	89	0
25½	12½	18½	5⅛	(sh) 330,000	N.P.	Maracaibo Oil.	....	.....	500	8½	8½	7⅝	8	— 1⅛
360	250	295	176	$45,942,800	$100	Mexican Petroleum.	$3Q	Jan. 20, 30	.....	....	....	....	....	.....
....	....	....	....	12,000,000	100	do pfd.	$2Q	Jan. 20, 30	.....	....	....	....	....	.....
73	4⅜	69⅜	9¼	(sh) 995,500	N.P.	Mexican Seaboard.	....	Nov. 15, 24	124,200	31	34¼	30⅞	34¼	+ 3
44½	25⅛	39⅞	22⅛	(sh) 1,857,461	N.P.	Mid-Continent.	50cQ	Feb. 15, 30	37,200	31¼	32⅞	31	32⅜	+ 1⅛
120½	103¼	121	120¼	$6,718,000	$100	do pfd.	$1.75Q	Dec. 1, 29	.....	....	....	....	....	.....
7⅜	2⅜	5⅛	¾	23,849,720	10	Middle States.	....	July 1, 23	.....	.....	.....	.....	.....	.....
5⅞	1½	3⅝	⅞	5,950,500	10	do ctfs.	.....	.....	9,800	1⅝	2	1½	1¾	0
2¼	1	1½	⅝	(sh) 3,500,000	N.P.	Pacific Oil.	....	.....	4,300	1⅛	1¼	1⅛	1⅛	0
55½	38¼	69	40¼	$50,000,000	$50	Pan American P. & T.	....	Oct. 20, 27	300	55	55¼	55	55¼	+ ⅛
58⅞	37¾	69¼	40¼	121,101,400	50	do B.	....	Oct. 20, 27	3,800	55	56½	55	55½	+ ⅞
28⅜	15½	17½	13½	(sh) 400,000	N.P.	Pan. American Western B.	....	Jan. 30, 27	.....	.....	.....	.....	.....	.....
21¾	11½	15¼	3	199,370	N.P.	Panhandle P. & R.	....	.....	5,800	7	7⅜	6½	7¼	+ ¼
106¼	70	76	47½	$2,935,200	$100	do pfd.	....	July 2, 23	.....	.....	.....	.....	.....	.....
53⅞	35¼	47	24¼	(sh) 2,406,803	N.P.	Phillips Petroleum.	50cQ	Apr. 1, 30	106,400	38¾	40⅝	38	40⅝	+ 2½
5¼	½	3⅜	1	$29,622,925	$25	Pierce Oil Corp.	....	.....	8,000	2	2⅛	1¾	2	— ⅛
50	16¼	51½	20	15,000,000	100	do pfd.	....	Feb. 1, 22	1,200	34	38	34	38	+ 4
6⅝	3½	5⅛	½	(sh) 2,500,000	N.P.	Pierce Petroleum.	.....	.....	32,700	5½	5⅞	5¼	5⅝	+ ⅛
64⅞	59½	65⅝	40½	$60,636,450	$25	Prairie Oil & Gas.	50cQ	Mar. 31, 30	9,300	49	54	49	52	+ 3⅛
....	....	65	45	101,250,000	25	Prairie Pipe Line.	‡75cQ	Mar. 31, 30	8,400	55¾	57	55½	56¼	+ ½
29⅛	16	25⅜	4	37,450,850	50	Producers & Refiners.	....	Sept. 15, 23	4,600	10⅝	11⅝	10⅝	11⅜	+ ¾
49⅝	41	46¾	25½	2,845,350	50	do pfd.	....	May 1, 25	180	35	35	35	35	0
31¼	19	30¾	20	75,959,255	25	Pure Oil Co.	37½cQ	Mar. 1, 30	56,900	25	26¼	25	26¼	+ 1½
119	108	116	108	13,000,000	100	do 8% pfd.	$2Q	Apr. 1, 30	60	..	114	112¾	114	+ ¼
56	23½	49⅝	20	47,127,725	25	Richfield Oil.	50cQ	Feb. 15, 30	50,300	26⅛	27⅝	25⅞	27	+ ⅜
....	....	42½	15	(sh) 1,200,000	N.P.	Rio Grande Oil Co.	50cQ	Jan. 25, 30	78,900	23⅝	25⅝	23½	25¼	+ 1¾
64	44⅝	64	43⅛	(sh) 546,646	$13.40	Royal Dutch N. Y. shares.	$1.3415	Feb. 5, 30	37,100	53¼	55¼	53	55	+ 2⅛
57⅛	39¾	55⅛	22⅝	(sh) 65,203,000	£2	Shell Transport & T.	97c	Jan. 28, 30	90	...	45⅝	45½	45½	0
39⅜	23¼	31⅜	19	12,254,979	N.P.	Shell Union Oil.	35cQ	Mar. 31, 30	50,600	23⅛	25	23	25	+ 1⅞
27¼	18⅜	40⅛	15	$8,357,280	$10	Simms Petroleum.	40cQ	Mar. 15, 30	50,800	33½	34½	32	34¼	+ 1⅜
46¾	17⅜	45	21	5,494,095	N.P.	Sinclair Consolidated.	50cQ	Jan. 15, 30	324,000	28	31¾	27⅞	31¾	+ 3⅞
110	102½	111	103	$16,025,200	$100	do pfd.	$2Q	Feb. 15, 30	.....	.....	.....	.....	.....	.....
42⅝	25	46½	28	27,396,590	25	Skelly Oil Co.	50cQ	Mar. 15, 30	76,700	34⅞	41	34⅛	41	+ 6⅛
80	53	81⅞	51½	(sh) 13,016,435	N.P.	S. O. California.	62½cQ	Mar. 15, 30	81,400	65⅛	72	65⅛	72	+ 6¾
59¾	37¾	83	48	$612,095,850	$25	S. O. New Jersey.	‡25cQ	Mar. 15, 30	490,200	73⅝	79⅞	72½	79¾	+ 6¼
45½	28¾	48⅛	31¼	434,094,575	25	S. O. New York.	40cQ	Mar. 15, 30	94,900	35¼	38	34¾	37⅞	+ 2¾
77	31½	84¾	53	(sh) 1,297,847	N.P.	Sun Oil.	‡25cQ	Mar. 15, 30	1,900	...	68¾	64	68⅜	+ 3⅜
110	110	105½	100	$5,000,000	$100	do pfd.	$1.50Q	Dec. 2, 29	480	...	104½	103½	104	+ ½
14¼	2½	24	5¼	(sh) 1,304,698	N.P.	Superior Oil Corp.	....	Dec. 20, 20	9,000	7½	7⅝	7⅛	7½	+ ⅜
74¾	50	71⅞	50	$211,082,925	$25	The Texas Corp.	75cQ	Apr. 1, 30	45,600	58	59⅜	57½	59	+ 1⅛
26⅝	12⅜	23⅞	9	8,380,340	10	Texas Pacific Coal & Oil.	2½%	Dec. 31, 29	8,300	12½	13⅜	12½	13⅛	+ ¼
41½	19⅝	40	14	(sh) 2,179,275	N.P.	Tide Water Oil Co.	20cQ	Mar. 31, 29	400	28	28	28	28	+ 2
100½	86¾	97½	85⅛	$20,321,000	$100	do 5½% pfd.	$1.25Q	Feb. 15, 30	800	90¼	92½	90⅛	92½	+ 2⅜
25	14¾	23½	10	(sh) 4,877,976	N.P.	Tide Water Associated.	30cQ	Feb. 15, 30	99,600	16	16¾	14⅞	16⅝	+ 1⅝
91⅜	81⅞	90⅞	74⅛	$72,989,200	$100	do pfd.	$1.50Q	Apr. 1, 30	1,100	86⅞	87⅞	86½	96⅛	— 1⅞
14½	6¾	15¼	5⅛	(sh) 3,842,029	N.P.	Transcontinental Oil.	.....	.....	136,400	19	21½	18¾	20	+ 1
58	42¾	54½	41⅛	$40,858,375	$25	Union Oil of California.	‡50cQ	Feb. 10, 30	9,400	45½	47¾	45⅜	47¾	+ 2¼
128½	110	163¾	33	31,101,200	100	Union Tank Car Co.	$1.25Q	Mar. 1, 30	2,700	35	37	35	36½	+ 1⅜
44⅞	26	42⅞	15	(sh) 488,359	N.P.	Warner Quinlan.	25cQ	Apr. 3, 30	9,600	18½	18½	18	18⅛	— ⅜
38	20⅛	38	25	(sh) 490,000	N.P.	White Eagle Oil & Refining.	50cQ	Jan. 20, 30	.....	.....	.....	.....	.....	.....
22⅛	17¼	29⅝	11½	(sh) 428,967	N.P.	Wilcox Oil & Gas.	....	May 10, 28	3,200	17⅞	18½	17⅞	18	+ 1

•New High †New Low xEx-Dividends ‡Also Extras s-Stock Total Sales 2,789,290

Cleveland Stock Market

April 4, 1930

Stock	Par	Bid	Asked
Canfield Oil Co.	$100	...	115
Fred G. Clark.	10	9	10
National Refining Co.	25	...	32½
do pfd.	100	132	...
Paragon Refining Co.	25	11	13
do pfd.	N.P.	35½	...
do ctfs.	..	10	12

We'll Pay And Pay And Pay

NEW YORK, April 4.—One hundred million dollars more, the American Petroleum Institute says, will have to come out of the pockets of the motorist this year than last year to pay the tax on gasoline. The nation's gasoline tax bill for 1930 will total $550,000,000, compared with $450,000,000 in 1929, the institute's preliminary estimates indicate.

When the 1930 tax bill will have been collected, motorists of the United States will have paid $1,744,400,000 in the past five years for a gasoline tax, or six times more than the total for the preceding five years, which total was $279,400,000.

RICHMOND, Va.—A business meeting with golf, horseback riding and a ball for diversion, has been arranged for Apr. 10, 11 and 12 for representatives of the Standard Oil Co. of New Jersey from the two Carolinas.

The meeting will be held at Myrtle Beach, S. C. Officials from New York are expected. J. C. King, state manager for South Carolina, and assistant state manager C. R. Young, were at Myrtle Beach recently making arrangements.

Phillips Buys Fort Smith Chain

BARTLESVILLE, Okla., April 5.—Phillips Petroleum Co. has bought the Beard Oil Co. of Fort Smith, Ark., which has 11 service stations and about 50 dealer outlets, also bulk and warehouse facilities. Phillips has expanded its marketing system the last two years to more than 750 bulk and service stations and more than 6500 dealer outlets.

Pittsburgh Stock Exchange

Transactions week ended April 4, 1930

	Sales	High	Low	Last	Change
Ark. Nat. Gas.	1,480	16½	16	16½	+ ½
do pfd.	798	8	7⅞	7⅞	0
Devonian Oil.	35	10	9⅞	10	0
Dixie & Util. pfd.	20	90	90	90	+3
Leonard Oil.	32,880	4⅛	3½	4	+ ½
Lone Star Gas.	6,770	44½	43½	44	— ¼
do pfd.	130	109¼	108¾	109¼	+ ¼
Plymouth Oil.	425	25	24½	25	0
Pgh. Oil & Gas.	638	3	3	3	0
Phoenix Oil.	7,200	.60	.40	.60	+.20
do pfd.	1,600	.50	.50	.50	—.05
Shamrock Oil & Gas	6,040	23½	22	22⅝	+ ⅜
Waverly Oil A.	225	18½	18	18½	+ ½

Pittsburgh Curb Market

Transactions week ended April 4, 1930

	Sales	High	Low	Last	Change
Arkansas Gas A.	1,265	16⅛	15½	16	+1
Gulf Oil.	500	156	156	156	+2

1929 Sets New Records In Oil Operations

WASHINGTON, March 21.—Oil companies operating crude gathering lines transported 1,005,598,000 barrels of crude from producing properties in the United States in 1929, according to figures of the U. S. Bureau of Mines.

The final figures of actual production, which will include all oil brought to the surface, may amount to 1,006,000,000 barrels, a new record for total production and a gain of 104,500,000 barrels, or 12 per cent over 1928 output.

The world's production of crude in 1929 totaled 1,488,604,000 barrels, an increase over 1928 output of 12 per cent, according to preliminary figures. Of this amount the United States produced 67.6 per cent, as compared with 68 per cent in 1928 and 71.4 per cent in 1927.

Stocks of all oils in this country increased 67,606,000 barrels in 1929, of which more than 18,000,000 barrels were refined products. November was the only month to show a decrease in stocks of all oils.

Texas, for the second consecutive year, was the leading producing state, with an output reaching 298,441,000 barrels in 1929. California was second with 292,037,000 barrels and Oklahoma third with 253,704,000 barrels.

Less crude was imported in 1929, and more was exported. Total imports amounted to 78,915,000 barrels in 1929, or some 850,000 barrels under the 1928 imports.

Exports of crude totaled 26,374,000 barrels, as compared with 18,966,000 barrels in 1928, a gain of 39 per cent.

Stocks of crude increased from 368,353,000 barrels east of California on Jan. 1, 1929, to 381,391,000 barrels on Dec. 31, an increase of 13,000,000 barrels. In California however, some 36,000,000 barrels were added to crude and fuel stocks in 1929, compared with 2,000,000 barrels added in 1928.

Crude runs to stills totaled 987,708,000 barrels in 1929, a gain of eight per cent over 1928 runs.

Gasoline output gained 15 per cent over 1928, totalling 434,241,000 barrels in 1929. Indicated domestic demand for gasoline increased 13 per cent in 1929, or 371,852,000 barrels. Stocks reached a peak of 48,205,000 barrels on March 31, and increased to a total of 43,115,000 barrels on Dec. 31, being more than 10,000,000 barrels above the total stocks on the first day of the year.

Natural gasoline output in 1929 was 2,195,400,000 gallons as compared with 1,777,700,000 gallons in 1928, a gain of 23 per cent. Stocks were practically unchanged.

THE OIL INDUSTRY EXCHANGE

Situations Open

DESIGNING ENGINEER

Firm specializing on Pipe Stills and complete Refinery Installations has opening for experienced designer and estimator. Permanent opportunity for technical graduate possessing initiative, experience and personality.

Address Box 522.

YOUNG MAN WANTED

Refinery trained. To make fire inspections and call on the Oil Trade. Excellent opportunity for some one with ambition. Apply by letter.

National Petroleum Mutual Fire Ins. Co., 437 Chestnut St., Philadelphia, Pa.

TREATER WANTED

Man experienced in treating of light oils both batch and continuous. Small plant with excellent opportunities for advancement.

Address Box 519

EQUIPMENT SALESMEN

An established station equipment company, selling a high grade line in competitive price range, has openings in several choice territories.

Men who have sold station equipment or who have wide acquaintance in oil company circles will be interested.

We have three Division Managerships open which will be filled from men who demonstrate their ability to produce results in assigned territory under contract on a commission basis.

Be explicit as to connections and references.

Address Box 518

Patent Attorneys

INVENTORS who derive largest profits know and heed certain simple, but vital facts before applying for patents. Our book, Patent Sense, gives those facts, free. Lacey & Lacey, 679 F. St., Washington, D. C. Established 1869.

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Advertisers having box numbers should be addressed in care of National Petroleum News, 1213 West 3rd Street, Cleveland, Ohio, unless otherwise specified.

For Sale

DISTRIBUTING BUSINESS FOR SALE, located in North Jersey, Sussex County. Fifty retail pumps, two trucks, two 100% stations, 40,000 storage and other items. Address Box 507.

MODERN BULK SERVICE STATION FOR sale—Ohio town 2,500, main line Penna. R. R. In heart town, only complete station here. 50% loan can be had. Priced for quick sale. REALITE COMPANY, PIQUA, OHIO.

STEEL MOTOR TANKER
For Sale

240,000 gallons on 8 feet. River and Sound —built 1929. Also steamers and barges to charter.

Rutland's Maritime Exchange,
82 Wall St., New York City.

Wanted to Buy

STORAGE TANKS WANTED

Oil company in Chicago is interested in the purchase of second-hand storage tanks. Reply stating size, price and location.

Address Box 523.

Business Opportunities

MARKETER OF PETROLEUM PRODucts in North-West, with good connections wants to get in touch with responsible refiner operating in Mid-Continent Field, preferably with connections in South America, who would be willing to invest a certain amount of money each year to create permanent outlets in a territory where expansion program would be warranted, where crop failures are unknown and where each year will see a greatly increased use of Petroleum Products.

Address Box 521.

PETROLEUM PRODUCTS BOUGHT ON COMMISSION

Make this office your Tulsa buying office on a commission basis.

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L. D. 136

Miscellaneous

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Advertisements set in special type or with border—$4.00 per column inch.

Copy must reach us not later than Friday preceding date of issue.

All advertisements carried on this page are payable in advance.

Standard Oil Stocks on New York Curb

1928 High	1928 Low	1929 High	1929 Low	Outstanding Capital	Par Value	Stocks	Div Rate	Last Paid	Transactions Week Ended April 5 Sales	First	High	Low	Last	Change
22⅜	14⅞	18¾	14¼	£4,126,460	£ 1	Anglo-American Oil	36c	June 5, 29	.....	....	....	....	....	.....
21¼	15	18	12¼	.....	....	do certificates	36c	June 5, 29	.....	....	....	....	....	.....
20½	14⅜	17	11	.....	£ 1	do ctfs. non-voting	36c	June 5, 29	.....	....	....	....	....	.....
5	1¼	2½	½	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	200	¾	¾	¾	¾	— 1/16
9¾	3¼	4⅛	1	$10,000,000	$50	do pfd	.....	.....	.....	....	....	....	....	.....
56	44½	46½	23¼	$1,000,000	25	Borne-Scrymser	$1 S.A.	Oct. 15, 29	.....	....	....	....	....	.....
76	58	74¼	55	10,000,000	50	Buckeye Pipe Line	$1Q	Mar. 15, 30	100	61¾	61¾	61¾	61¾	— 1/16
161	117¼	210	130	3,000,000	25	Chesebrough Mfg	‡$1Q	Mar. 31, 30	800	170	170	165	165	— 3¼
23	16	29	8⅛	36,123,350	10	Continental Oil	.....	Dec. 15, 27	2,100	16½	17½	16½	17¼	+ 1⅛
17½	9½	11¾	5⅝	.....	N.P.	Creole Petroleum	.....	.....	5,800	6¾	6⅞	6½	6¾	0
82	67	95	40	1,500,000	50	Cumberland Pipe Line	$1Q	Mar. 15, 30	50	41	41	41	41	— 1/16
88	64½	70½	42	5,000,000	100	Eureka Pipe Line	$1Q	Feb. 15, 30	50	44	44	44	44	0
13	4¼	7	3	16,000,000	100	Galena Signal Oil	.....	June 25	.....	....	....	....	....	.....
86	26	90	73½	4,000,000	100	do new pfd	.....	June 26	.....	....	....	....	....	.....
89¾	35	88	71½	2,000,000	100	do old pfd	.....	June 26	.....	....	....	....	....	.....
114¾	59¼	128	74⅛	73,685,700	25	Humble Oil & Refining	50cQ	Apr. 1, 30	24,700	113	116⅞	112	115¾	+ 4¾
290½	176½	340½	260	20,000,000	100	Illinois Pipe Line	$4.50	Mar. 15, 30	55	306¼	306¼	306¼	306¼	+ 1
104	56¾	41	22	(sh) 26,421,768	N.P.	Imperial of Canada	12½cQ	Mar. 1, 30	11,300	26⅞	27¾	26½	27¾	+ 1⅛
91⅞	74⅝	41⅞	26	$1,000,000	$10	Indiana Pipe Line	‡50cQ	Feb. 15, 30	2,200	38½	38⅞	37⅞	38⅞	+ ⅜
55	35	37½	15	(sh) 14,247,088	N.P.	International Petroleum	25c	Mar. 15, 30	8,800	22¼	22¾	21⅞	22⅛	+ ⅛
32⅜	19⅜	25⅞	10½	$6,363,350	12.50	National Transit Co	25cQ	Mar. 15, 30	1,800	20⅝	20⅝	20	20½	— 1/16
75	38½	85	72	1,000,000	10	New York Transit	‡40cQ	Jan. 15, 30	.....	....	....	....	....	.....
....	....	....	....	.....	....	do new	.....	.....	100	14	14	14	14	0
69	56½	63	41	2,000,000	50	Northern Pipe Line	$2 S.A.	Jan. 2, 30	.....	....	....	....	....	.....
83¼	58½	79⅞	64⅛	60,000,000	25	Ohio Oil Co	‡50cQ	Mar. 15, 30	900	74	74⅞	74	74	+ 1/16
84	28	44½	18⅝	10,000,000	25	Penn Mex. Fuel	$1	Dec. 14, 29	3,700	20⅞	26	20⅞	23	+ 2⅛
220	167	50	26	4,000,000	25	Solar Refining	$1.25 S.A.	Dec. 20, 29	100	25⅛	25⅛	25⅛	25⅛	0
19	12	23½	13	1,000,000	10	Southern Pipe Line	$1	Mar. 1, 30	100	14⅞	14⅞	14⅞	14⅞	— 1/16
71⅞	36¾	60¼	35⅛	30,000,000	25	South Penn Oil	‡50cQ	Mar. 31, 30	4,700	44½	45	44	45	+ ⅝
102	70	70	45	1,750,000	50	South West Pa. Pipe Lines	$1	Apr. 1, 30	.....	....	....	....	....	.....
95⅞	70⅞	63	45	348,175,069	25	S. O. Indiana	62½cQ	Mar. 15, 30	57,600	56⅜	58½	56⅛	58½	+ 2⅛
27¾	15	40	18	8,000,000	25	S. O. Kansas	50cQ	Mar. 15, 30	.....	....	....	....	....	.....
49	44	46⅜	29	25,654,516	10	S. O. Kentucky	‡40cQ	Mar. 31, 30	3,800	36	37	35⅛	36½	+ ⅞
54⅝	39⅞	50¼	40	4,649,225	25	S. O. Nebraska	‡62½cQ	Mar. 20, 30	100	48½	48½	48¼	48¼	+ ¾
34	71	129	60	14,000,000	25	S. O. Ohio	62½cQ	Apr. 1, 30	300	99¾	104	97¼	104	+ 7¼
25	116	125½	106	7,000,000	100	do pfd	$1.75Q	Mar. 1, 30	.....	....	....	....	....	.....
23½	16	18	5⅛	861,466	25	Swan Finch	30c	Jan. 15, 29	.....	....	....	....	....	.....
111	72	133¾	75	126,154,000	25	Vacuum Oil	$1Q	Mar. 20, 30	14,100	92⅛	94¾	90⅛	94	+ ⅞

*New High †New Low ‡Also Extras.

Independent Oils on New York Curb

1928 High	1928 Low	1929 High	1929 Low	Par Value	Stocks	Transactions Sales	Week First	Week High	Week Low	Week Last	April 5 Change
1½	.53	.72	.125	$5	Amer. Cons. Oilfields	18,800	¼	5/16	3/16	¼	0
9½	3⅛	8⅝	1⅜	N.P.	Amer. Maracaibo	3,300	2⅛	2½	2	2	— ⅛
4½	2¼	4¾	1	$10	Argo Oil	.....	.....	.....	.....	.....	.....
3¾	3⅜	26	3¾	N.P.	Arkansas Nat. Gas	23,400	15¾	16⅝	15⅝	16½	+ ⅛
....	....	24¾	6½	N.P.	do A	109,100	15⅜	16⅝	15¼	16½	+ 1
....	....	9	4	10	do pfd	300	7⅞	7⅞	7⅞	7⅞	+ ⅛
55	32¾	70	50	N.P.	British American Oil	.....	.....	.....	.....	.....	.....
23⅛	3¾	4⅞	⅞	25c	Carib Syndicate	400	1⅞	1⅞	1½	1½	— ¼
....	....	68⅛	20	N.P.	Cities Service new	224,100	41⅝	43⅜	41½	42	+ ¼
103½	94½	99¼	84	100	do pfd	1,600	93½	93⅞	93½	93⅝	+ ¼
9⅝	8⅛	9¼	8	10	do pref. B	.....	.....	.....	.....	.....	.....
97	88½	96	81	100	do pref. BB	100	84½	84½	84½	84½	+ ½
2¼	1	1½	¼	1	Colombia Syndicate	8,800	3/16	3/16	1/16	3/16	0
17¾	9¾	15	3⅞	N.P.	Colon Oil	3,800	7½	7½	6¾	7	— ⅛
8⅞	6¼	11⅛	2½	10	Consolidated Royal	200	4⅝	4⅝	4⅝	4⅝	+ ⅛
....	....	135	42	N.P.	Cosden Oil Co	8,400	51	56	50	56	+ 6
....	....	82	55	....	do pfd	.....	.....	.....	.....	.....	.....
3¼	.76	2½	¼	N.P.	Crown Central	400	¾	¾	¾	¾	0
15	6¾	11¾	4	N.P.	Crystal Oil	.....	.....	.....	.....	.....	.....
50	48	51⅛	51⅛	$100	do pfd	.....	.....	.....	.....	.....	.....
33½	8⅛	26	6½	N.P.	Darby Petroleum	8,800	9⅞	10⅞	9⅞	10¾	+ ⅞
2⅞	1	11	2	N.P.	Derby Oil & Refining	8,800	7¾	7¾	7¼	7⅝	+ ⅝
21⅛	7½	44	5	N.P.	do pfd	400	38⅜	40¼	38⅜	40¼	+ 4¼
165	101⅛	209	115	$25	Gulf Oil Corp	14,800	153	156¾	150¼	155½	+ 3
7½	5⅝	7½	1⅜	5	Homaokla Oil	.....	.....	.....	.....	.....	.....
....	....	53⅜	5	$1	Indian Territory	38,200	53⅜	*53⅜	50	52⅛	+ 2⅛
3⅛	1	2⅞	⅜	10	Intercontinental Pet	14,300	1½	1½	1⅜	1⅜	— ⅛
3	¼	3⅝	1¼	N.P.	Kirby Petroleum	2,800	2⅞	3	2⅝	3	0
9⅜	5½	6⅛	1	N.P.	Leonard Oil & Dev	28,800	3⅜	4	3¼	4	+ ½
43⅜	20	38⅞	18	N.P.	Lion Oil & Refg	3,900	24⅛	29	24⅛	29	+ 5
....	....	67⅞	28	N.P.	Lone Star Gas	2,800	44¼	47⅞	43½	47	+ 3⅛
1⅞	.50	1¼	¼	1	Magdalena Syndicate	500	1/16	1/16	¼	¼	0
48½	32	38½	15	N.P.	Margay Oil	.....	.....	.....	.....	.....	.....
8	2¾	6⅜	2	N.P.	Mexico-Ohio Oil	100	2¾	2¾	2¾	2¾	— ⅛
....	....	42	8	N.P.	Missouri-Kan. P. L.	18,700	28¼	28½	28⅜	28½	+ ⅜
1¾	.76	1½	¼	1	Mountain & Gulf	3,900	5/8	¾	5/8	5/8	0
28⅛	19½	22⅞	7	10	Mountain Producers	2,800	11⅞	11⅞	11⅜	11⅞	— ⅛
....	....	43⅞	24	N.P.	Nat. Fuel Gas (new)	2,300	34	34½	33½	34¼	+ ⅛
5⅜	4¼	5	2¼	5	New Bradford	900	3⅜	3¼	2⅜	3⅛	— ⅜
5½	3	3⅞	2¾	10	New England Fuel	.....	.....	.....	.....	.....	.....
11⅞	7⅛	9⅜	2¼	1	New Mex. & Ariz	200	6	6	5¾	5¾	— ⅜
15½	11½	24½	10½	25	New York Petrol	100	10¼	10¼	10¼	10¼	— 1⅜
13¼	8⅛	18½	6⅛	N.P.	North Cent. Texas	600	9¼	10⅜	9¼	9⅜	+ ⅜
....	....	19¼	8⅜	N.P.	Oil Stock, Ltd. A	500	10	10⅜	10	10⅜	+ ⅜
....	....	18¼	8½	N.P.	do B	2,500	10⅞	11	10	11	+ ⅛
26¼	20	26⅝	12⅛	N.P.	Pacific Western Oil	800	16	18½	16	18½	+ 2½
6	2¼	3½	½	N.P.	Pandem Oil	23,100	2¼	2⅜	2⅛	2⅜	+ ⅛
15⅝	8½	10½	2⅜	N.P.	Pantepec Oil	500	3⅝	3¾	3⅝	3⅝	0
20	10⅝	25½	22½	$25	Paragon Refg. B ctfs.	.....	.....	.....	.....	.....	.....
....	....	34½	17	N.P.	Petroleum Corp	92,800	22⅞	25⅞	22⅝	25¾	+ 2⅞
31⅜	26½	37	22	N.P.	Plymouth Oil	1,200	25	26½	24¾	25⅜	+ ⅝
18	8	16	9	25	Red Bank Oil	.....	.....	.....	.....	.....	.....
13	4⅛	8½	1⅜	N.P.	Reiter-Foster	800	2¾	2⅞	2¾	2⅞	+ ¼
31½	23¼	25½	19	$25	Richfield pfd	.....	.....	.....	.....	.....	.....
....	....	29	13	....	Root Refining pfd	200	17	17¼	15½	15½	0
12	4⅝	11	3	N.P.	Ryan Consolidated	1,700	4	4⅝	4	4½	+ ½
7¼	5½	5⅞	1⅞	$10	Salt Creek Cons	100	2¼	2¼	2¼	2¼	— ¼
35	23¼	25⅛	9	10	Salt Creek Prod	3,800	14⅜	14½	14	14¼	— ⅛
3½	1	2½	½	5	Savoy Oil	100	¾	¾	¾	¾	— ¼
40	27	33⅜	10	25	Shreveport El Dorado	.....	.....	.....	.....	.....	.....
....	....	24	9	N.P.	Southland Royalty	5,200	10½	10¾	10	10½	0
....	....	12	4	N.P.	Sunray Oil	4,600	7	7½	6¾	7½	+ ⅜
....	....	23	7½	N.P.	Texon Oil & Land new	400	11¼	11¼	11¼	11¼	— 1⅜
22⅞	13	16⅞	11⅝	$10	Tidal Osage	.....	.....	.....	.....	.....	.....
21¼	13⅜	16½	10⅛	10	do not-voting	.....	.....	.....	.....	.....	.....
93¾	75	155	80	100	Transcontinental pfd	.....	.....	.....	.....	.....	.....
74¼	18	81⅛	66	10	Venezeula-Mexico	.....	.....	.....	.....	.....	.....
9⅛	4¾	6½	1⅜	3	Venezuelan Petrol	5,500	3¾	3⅞	3⅝	3⅝	— ⅛
....	....	66	2¼	N.P.	White Star Oil	.....	.....	.....	.....	.....	.....
8¼	4¼	9¼	2	1	Woodley Petroleum	1,200	2½	2¾	2½	2½	— ⅛
⅜	⅜	5⅜	¼	25	Y Oil & Gas	500	1⅛	1¼	1⅛	1¼	+ ⅛

*New High †New Low

New York Curb Bonds

Week ending Apr. 4

	High	Low	Last	Change
Beacon Oil 6s '36	103	104	*103	+ ⅞
Cities Serv. 5s '66	88	87⅜	87½	— 1/16
Cities Serv. G. P. 6s '43	95	93½	93½	— ½
Cont. Oil 5⅛s '37	98	97½	97½	— 1/16
Empire O & R 5½s '42	88½	87½	87¾	+ ⅜
Gulf Oil 5s '37	101	100½	100¾	+ ½
Gulf Oil 5s '47	101¾	101	101¾	0
Indep. Oil 6s '39	109¾	105⅝	109¾	+ ¾
Pure Oil 5½s '40	98	97½	97¾	— ⅛
Sun Oil 5½s '39	102	101¾	101¾	— ⅛
Union Oil of Calif. 5s '54	99¾	99½	99⅝	— 1/16
Valvoline Oil 7s '37	103½	103½	103½	0

New York Bonds

Week ending Apr. 4

	High	Low	Last	Change
Atlantic Refg. deb. 5s	102½	102	102½	0 1
Cal. Pet. 5s	99¼	99¼	99¼	0
Cal. Pet. 5½s	101¾	101½	101¾	+ 1/16
General Pet. 5s	101½	101⅜	101½	+ 1/16
Humble Oil & Refg. 5s	102	101⅛	101¼	— ⅛
Humble Oil & Refg. 5½s	102⅛	101⅜	101⅝	— 1/16
Pan Amer. P & T 7s	104¾	104¾	104¾	0
Pan Amer. P & T 6s	102½	102½	102½	—1/16
Pan Amer. P & T 6s	97	96¾	96¾	0
Phillips Pet. 5⅛s	95¼	94¾	95¼	+ 1/16
Pure Oil 5½s	99⅜	98½	99	— ⅜
Richfield Oil Calif. 6s	97	96½	97	0
Shell Union Oil 5s	98	97	97¼	— 1/16
Shell Union Oil 5s war	100⅞	100	100½	— 1/16
Sinclair Con. Oil 7s	104	103¼	104	+ 1/16
Sinclair Con. Oil 6½s	102½	102	102½	+ 1/16
Sinclair Con. Oil 6s D	100¾	100½	100¾	+ 1/16
Sinclair Con. Crude 5½s	100	99½	100	+ 1/16
Sinclair Pipeline	99	97½	98¾	+ 1/16
Skelly Oil 5½s	95¼	94½	95¼	— 1/16
S. O. N. J. 5½s	103¾	102⅞	103⅜	— 1/16
S. O. N. Y. 4½s	97½	96¾	97¼	— 1/16
Union Oil of Calif. 6s A	108¼	108¼	108¼	— 1/16
Union Oil of Calif. 5s C	100¼	100	100⅛	+ 1/16
Warner-Quinlan 6s	88⅞	87½	87¾	— ⅜
White Eagle Oil 5½s war.	107	106½	106½	+1½

Each Auto To Travel 6000 Miles

NEW YORK,—That automobiles will travel 156,000,000,000 miles in 1930 in the United States, or an average of 6000 miles per vehicle, is the statement of Alvan Macauley, president of the National Automobile Chamber of Commerce, and president of the Packard Motor Car Co.

This total of miles, to be covered on gasoline propelled wheels in a single year, is more than 4000 times the distance to the planet Mars, he says.